DRAFT

ENVIRONMENTAL ASSESSMENT OF INSTALLATION DEVELOPMENT AT MCCHORD AIR FORCE BASE, WASHINGTON

HEADQUARTERS AIR MOBILITY COMMAND

OCTOBER 2007

ABBREVIATIONS AND ACRONYMS

$\mu g/m^3$	micrograms per cubic meter
22 STS	22d Special Tactics Squadron
446 AW	446th Airlift Wing
62 AW	62d Airlift Wing
62 AW/SEW	62d Airlift Wing/Weapons Safety Office
62 CES/CEV	62d Civil Engineering Squadron/Environmental Flight
ACM	asbestos-containing material
AFB	Air Force Base
AFI	Air Force Instruction
AFPD	Air Force Policy Directive
AFRC	Air Force Reserve Command
AFSOC	Air Force Special Operations Command
AGE	aerospace ground equipment
AICUZ	Air Installation Compatible Use Zone
AMC	Air Mobility Command
AMP	Asbestos Management Plan
ANG	Air National Guard
AOD	Area of Development
APE	Area of Potential Effect
APZ	Accident Potential Zone
AQCR	air quality control region
AT/FP	Anti-Terrorism/Force Protection
BD/DR	Building Demolition/Debris Removal
BMP	best management practice
BRAC	Base Realignment and Closure
CAA	Clean Air Act
CAAA	Clean Air Act Amendments
CATEX	Categorical Exclusion
CEQ	Council on Environmental Quality
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CESI	Civil Engineering Squadron Instruction
CFR	Code of Federal Regulations
CO	carbon monoxide
CRM	Cultural Resources Manager
CWA	Clean Water Act
CY	Calendar Year
dB	decibels
dBA	A-weighted decibels
DERP	Defense Environmental Restoration Program
DNL	day-night average A-weighted sound level
DOD	Department of Defense
DRMO	Defense Reutilization and Marketing Office
EA	Environmental Assessment
EIAP	Environmental Impact Analysis Process
EIS	Environmental Impact Statement
EO	Executive Order
EOD	Explosive Ordnance Disposal
ERP	Environmental Restoration Program
ESA	Endangered Species Act
FAA	Federal Aviation Administration
FEMA	Federal Emergency Management Agency
FIS	Fighter Interceptor Squadron
FONPA	Finding of No Practicable Alternative
FONSI	Finding of No Significant Impact
ft^2	square feet
FUB	Facility Utilization Board
FY	Fiscal Year
GIS	Geographical Information System
GOTW	Government Owned Treatment Works
GOV	government-owned vehicle
gpm	gallons per minute
HAZMART	hazardous materials pharmacy
HAZWOPER	Hazardous Waste Operations and Emergency Response
HQ	Headquarters
HUD	U.S. Department of Housing and Urban Development
I-5	Interstate Highway 5
ICRMP	Integrated Cultural Resources Management Plan
IDEA	Installation Development Environmental Assessment
IICEP	Interagency and Intergovernmental Coordination for Environmental Planning

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INRMP	Integrated Natural Resources Management Plan
JP-8	jet fuel
kV	kilovolt
LBP	lead-based paint
MAJCOM	Major Command
MFH	Military Family Housing
mg/m^3	milligrams per cubic meter
mgd	million gallons per day
MILCON	Military Construction
MMRP	Military Munitions Response Program
MOGAS	unleaded engine fuel
MSL	mean sea level
NAAQS	National Ambient Air Quality Standards
NAF	Nonappropriated Funds
NAGPRA	Native American Graves Protection and Repatriation Act
NEPA	National Environmental Policy Act
NHPA	National Historic Preservation Act
NO_2	nitrogen dioxide
NO_x	nitrogen oxide
NPDES	National Pollutant Discharge Elimination System
NRCS	Natural Resources Conservation Service
NRHP	National Register of Historic Places
O&M	Operations and Maintenance
O_3	ozone
OSHA	Occupational Safety and Health Administration
Pb	lead
PCB	polychlorinated biphenyl
pCi/L	picocuries per liter
$PM_{2.5, 10}$	particulate matter equal to or less than 2.5 or 10 microns in diameter
POL	petroleum, oil, and lubricant
POV	privately owned vehicle
ppm	parts per million
PSCAA	Puget Sound Clean Air Agency
PSD	Prevention of Significant Deterioration
PSE	Puget Sound Energy
PSIAQCR	Puget Sound Intrastate Air Quality Control Region
PTE	potential to emit
QD	quantity-distance
RCRA	Resource Conservation and Recovery Act
ROI	Region of Influence
SAP	satellite accumulation point
SARA	Superfund Amendments and Reauthorization Act
SHPO	State Historic Preservation Office
SIP	State Implementation Plan
SO_2	sulfur dioxide
SPCCP	Spill Prevention, Control, and Countermeasures Plan
SWPPP	Storm Water Pollution Prevention Plan
TNC	The Nature Conservancy
tpy	tons per year
U.S.C.	United States Code
UFC	Unified Facilities Criteria
USACE	U.S. Army Corps of Engineers
USAF	U.S. Air Force
USEPA	U.S. Environmental Protection Agency
USFWS	U.S. Fish and Wildlife Service
UST	underground storage tank
UXO	unexploded ordnance
VOC	volatile organic compound
WADOE	Washington Department of Ecology
WAC	Washington Administrative Code
WADS	Washington Air Defense Squadron
WDFW	Washington Department of Fish and Wildlife
WSA	weapons storage area

DRAFT

FINDING OF NO SIGNIFICANT IMPACT

ENVIRONMENTAL ASSESSMENT OF INSTALLATION DEVELOPMENT AT McCHORD AIR FORCE BASE, WASHINGTON

INTRODUCTION

In an effort to improve installation planning, streamline compliance with the National Environmental Policy Act (NEPA), and accomplish installation development, the United States Air Force Headquarters Air Mobility Command and the 62d Airlift Wing (62 AW) have initiated an Environmental Assessment (EA) of foreseeable and reasonable planned and programmed projects that could be implemented within the next 5 years at McChord Air Force Base (AFB). Since the establishment of McChord AFB, installation development has been a continuing activity. Every year, structures are demolished, facilities are constructed, and infrastructure is upgraded. This decision document is based on an Installation Development Environmental Assessment (IDEA) attached to and incorporated herein by reference. The intent of the IDEA is to analyze the Proposed Action of implementing installation development actions on McChord AFB, while avoiding environmentally sensitive areas.

The Proposed Action includes projects that could be executed during the next 5 years including facility construction, repair or renovation; upgrades to utilities and infrastructure; and the demolition of unneeded facilities. The scope of the IDEA includes an evaluation of alternatives for the projects and an analysis of their direct, indirect, and cumulative effects on the natural and man-made environments.

PURPOSE OF AND NEED FOR THE PROPOSED ACTION

The purpose of the Proposed Action is to implement the wing-approved installation development projects found within all community plans for McChord AFB, including the Base General Plan. All plans for McChord AFB were examined to produce a consolidated list of projects to accomplish the planned and programmed development of the installation over the next 5 years. The Proposed Action does not include any projects that would impact wetlands, floodplains, or areas where threatened and endangered species are known to occur.

The need for the Proposed Action is to support air mobility missions associated with McChord AFB. This need involves meeting ongoing mission requirements while supporting the morale and welfare of the warfighter and preparing the installation to accept additional missions in the future.

DESCRIPTION OF THE PROPOSED ACTION

The Proposed Action is to implement numerous installation development projects as found in the community plans for McChord AFB. The projects comprising the Proposed Action analyzed in the IDEA fall under three categories: demolition; construction including renovations, alterations, and repairs; and infrastructure projects. The IDEA used information obtained from other environmental impact analysis process documents for similar actions to determine the direct, indirect, and cumulative impacts of the projects proposed for installation development at McChord AFB.

Demolition Projects. McChord AFB proposes 18 demolition projects that could occur over the next 5 years to achieve efficiency and support growth associated with its mission requirements. These facilities proposed for demolition have been deemed too costly to repair or renovate and no longer meet the mission needs of McChord AFB. Full implementation of the proposed demolition projects would eliminate approximately 449,370 square feet (ft^2) of impervious surfaces, minimizing the area of undisturbed land required for proposed construction projects.

Construction Projects. McChord AFB proposes 24 facility construction, renovation, and alteration projects that could occur over the next 5 years to support mission requirements and comply with force protection requirements. The footprint of these facilities and associated pavements would occupy approximately 750,940 ft^2. In order to continue enhancing the compatibility of designated land uses at McChord AFB, proposed facilities would be constructed in appropriate land use areas of the installation.

Infrastructure Projects. McChord AFB proposes 24 infrastructure projects that could occur over the next 5 years to support future mission requirements and to comply with force protection requirements. These projects include upgrades to or development of airfield pavements, utilities, parking facilities, and fuel systems. Proposed infrastructure projects could disturb approximately 3.8 million ft^2 and increase impervious surfaces by approximately 117,950 ft^2.

SUMMARY OF ANTICIPATED ENVIRONMENTAL EFFECTS ASSOCIATED WITH THE PROPOSED ACTION

Minor, short-term, direct, adverse effects resulting from construction and demolition activities would affect the noise environment, air quality, safety, geological resources, water resources, biological resources, and hazardous materials and wastes. Adverse effects associated with construction and demolition activities would be localized to the immediate area of work and would subside following the end of construction and demolition activities in each affected area. Minor, short-term, direct and indirect, beneficial effects on socioeconomic resources would also occur on the local community from procurement of goods and services during construction; however, expenditures associated with construction are short-term and would have no long-lasting community benefits.

Minor, long-term, direct and indirect, adverse effects on geological resources, water resources, and biological resources could occur. Proposed facilities construction and some infrastructure projects would result in an overall increase in impervious surfaces and loss of vegetation.

Minor, long-term, direct and indirect, beneficial effects on land use, air quality, safety, infrastructure, and hazardous materials and wastes would be expected from the demolition of unneeded facilities and the construction of modern, efficient infrastructure.

Minor, short-term, adverse effects and long-term, beneficial effects would be expected due to the removal of asbestos and lead-based paint in older buildings. All removal and abatement would be accomplished in accordance with Federal, state, and local regulations. Construction activities proximate to any contaminated sites would be accomplished in accordance with Federal, state, and local regulations.

No direct effects on the 100-year floodplain, wetlands, or threatened and endangered species would be expected. One proposed project is to replace overhead electrical distribution with underground distribution; in areas of McChord AFB where existing overhead lines cross Clover Creek, those lines would remain overhead to avoid impacting wetlands. No other projects are proposed in the vicinity of wetlands or floodplains. No threatened or endangered species would be expected to occur in the vicinity of any of the proposed projects, but the proposed addition to an existing flight simulator facility could affect 0.25 acres of ponderosa pine, which is considered valuable wildlife habitat. Any project determined to have the potential to affect federally listed threatened or endangered species, state-protected species, or their habitat would involve separate consultation with the appropriate Federal and state agencies. Similarly, any project analyzed in the IDEA, that is subsequently identified to impact a wetland or floodplain, would be coordinated with the appropriate Federal and state regulatory authorities to obtain necessary approval and ensure best management practices are used to minimize erosion and sedimentation. Additional environmental analysis would be required if the potential to adversely impact wetlands, threatened or endangered species, or other protected natural resources is identified during project design or execution.

No adverse effects on cultural resources would be expected. Several proposed projects would occur within the McChord Field Historic District or could directly affect contributing elements to the historic district. McChord AFB has a design review process in place to ensure that these projects would be

completed in a manner that would ensure they are compatible with existing structures that comprise the historic district. Therefore, these proposed projects would not be expected to adversely affect the historic district. Construction and infrastructure projects adjacent to the historic district would also undergo design review to ensure that would not adversely affect the viewshed of the historic district. Any project with the potential to affect the historic district would be coordinated with the installation's Cultural Resources Manager and the State Historic Preservation Office, as appropriate, prior to implementation to ensure there would be no adverse effects on historic properties. No effects on archaeological resources or resources of traditional, religious, or cultural significance to Native American Tribes would be expected.

INTERAGENCY AND INTERGOVERNMENTAL COORDINATION PLANNING AND PUBLIC REVIEW

The Interagency and Intergovernmental Coordination for Environmental Planning (IICEP) process associated with preparation of the EA was conducted for 30 days, beginning May 29, 2007. The EA is to be made available for public review as a part of the EA development process.

FINDING OF NO SIGNIFICANT IMPACT

I conclude that the environmental effects of the proposed installation development at McChord AFB are not significant, that preparation of an Environmental Impact Statement is unnecessary, and that a Finding of No Significant Impact is appropriate. The preparation of the EA is in accordance with NEPA, Council on Environmental Quality regulations, and 32 Code of Federal Regulations Part 989, as amended and is herein incorporated by reference.

LEONARD A. PATRICK
Brigadier General (Sel), USAF
Director, Installations & Mission Support

Date

Attachment: Environmental Assessment

COVER SHEET

DRAFT ENVIRONMENTAL ASSESSMENT OF INSTALLATION DEVELOPMENT AT MCCHORD AIR FORCE BASE, WASHINGTON

Responsible Agencies: U.S. Air Force (USAF), Headquarters Air Mobility Command (AMC) at Scott Air Force Base (AFB), Illinois, and 62d Airlift Wing (62 AW) at McChord AFB, Washington.

Affected Location: McChord AFB, Pierce County, Washington.

Proposed Action: Implementation of approved installation development plans.

Report Designation: Draft Environmental Assessment (EA).

Written comments and inquiries regarding this document should be directed to: 62 AW/PA, 100 Col Joe Jackson Blvd, Suite 1077, McChord AFB, WA 98438-1109.

Abstract: McChord AFB uses numerous 62 AW-approved plans to project installation development requirements. These plans propose demolition, construction, and infrastructure improvement activities intended to ensure that the installation can sustain its current and future national security operations and mission-readiness status. These projects include installation development projects contained in the McChord AFB General Plan and the community of all existing Wing-approved development plans. McChord AFB seeks to improve the continuing installation development process by evaluating in a single EA actions proposed in the McChord AFB Wing-approved community of plans for installation development, called the Installation Development EA (IDEA). The Proposed Action includes numerous projects, such as demolition of aging facilities, new facility construction, facility upgrades, facility repair and renovation, utilities upgrades, community living upgrades, infrastructure upgrades, and recreational upgrades that would be completed or implemented during the next 5 years. The intent of this IDEA is to address the Proposed Action of implementing installation development actions as found in the community of existing approved plans concerning continuing development on McChord AFB. The scope of the IDEA includes an evaluation of alternatives for the various projects and analysis of the cumulative effects on the natural and man-made environments.

Through this IDEA, McChord AFB provides a constraints-based environmental impact analysis of installation development actions projected for the installation over the next 5 years. A constraints approach enables McChord AFB to evaluate environmental concerns that exist throughout the installation and those unique to specific areas of the installation. The analysis draws from the knowledge gained from extensive recent evaluations for similar types of projects to determine the direct, indirect, and cumulative effects of projects that would be completed as part of the installation's development.

This EA has been prepared to evaluate the Proposed Action and alternatives, including the No Action Alternative. If potentially significant impacts are determined to be associated with the Proposed Action during the course of preparing this IDEA, it might be necessary to prepare an Environmental Impact Statement (EIS). Resource areas that are addressed in the EA include noise, land use, air quality, safety, geological resources, water resources, biological resources, cultural resources, socioeconomic resources and environmental justice, infrastructure, and hazardous materials and waste management. The EA will be made available to the public for comments during development and upon completion.

PRIVACY ADVISORY

Your comments on this document are welcome. Letters or other written comments provided to the proponent concerning this document may be published in the EA. Comments will normally be addressed in the EA and made available to the public. Any personal information provided will be used only to identify your desire to make a statement during the public comment period or to fulfill requests for copies of the EA or associated documents. Private addresses will be compiled to develop a mailing list for those requesting copies of the EA. However, only the names of the individuals making comments and specific comments will be disclosed; personal home addresses and phone numbers will not be published in the EA.

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ENVIRONMENTAL ASSESSMENT OF INSTALLATION DEVELOPMENT AT MCCHORD AIR FORCE BASE, WASHINGTON

HEADQUARTERS AIR MOBILITY COMMAND
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OCTOBER 2007

DRAFT ENVIRONMENTAL ASSESSMENT OF INSTALLATION DEVELOPMENT AT MCCHORD AIR FORCE BASE, WASHINGTON

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1. Purpose, Need, and Scope

The 62d Airlift Wing (62 AW) at McChord Air Force Base (AFB), Washington, and Headquarters (HQ) Air Mobility Command (AMC) believe a comprehensive U.S. Air Force (USAF) Environmental Impact Analysis Process (EIAP) document would improve the continuing activity of installation development and streamline the National Environmental Policy Act (NEPA) compliance process. As a result, 62 AW and HQ AMC will initiate an evaluation in this Environmental Assessment (EA) of programmed and reasonably foreseeable projects identified for the next 5 years. Since the establishment of McChord AFB, as with all other USAF installations, development of the installation has continuously occurred. Every year in the history of the installation, structures have been demolished, new facilities constructed, and infrastructure upgraded. This document constitutes an Installation Development EA (IDEA). The intent of the IDEA is to address the Proposed Action of implementing installation development actions as found in the community of existing approved plans on McChord AFB. These projects are a compilation of installation development activities as described in the McChord AFB General Plan (62 AW 2005a) and other known and 62 AW-approved base plans. The IDEA helps facilitate efforts to coordinate land use planning and infrastructure projects, expedite project execution by using early planning, and encourage agency coordination. In addition to evaluating the projects as described, this EA serves as a baseline for future environmental analysis of mission and training requirements.

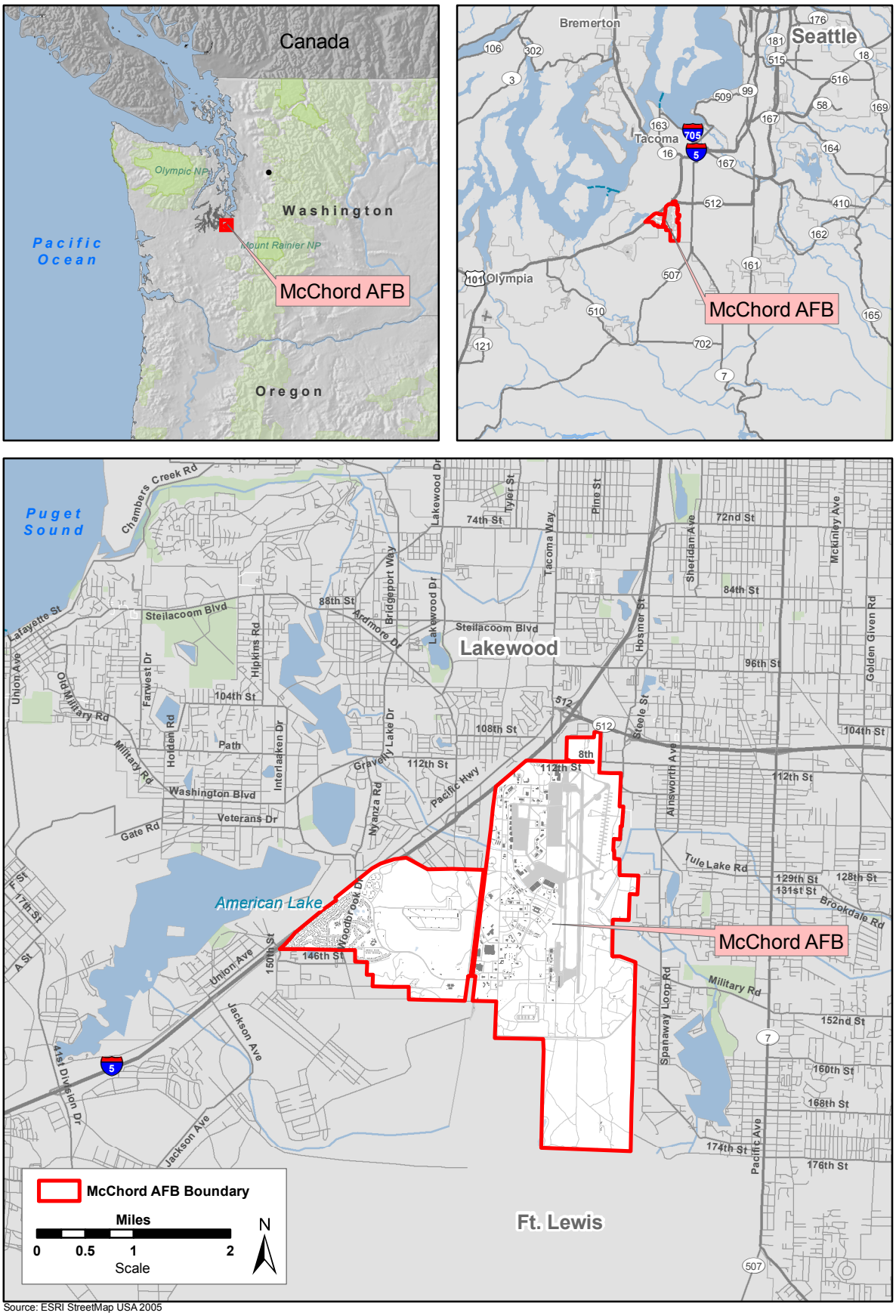
This section of the document includes five subsections: background information on the location and mission of McChord AFB, a statement of the purpose of and the need for the Proposed Action, an overview of the scope of the analysis, a summary of key environmental compliance requirements, and an introduction to the organization of this IDEA.

1.1 Background

McChord AFB is in Pierce County, approximately 6 miles east of Puget Sound in western Washington (see **Figure 1-1**). This military installation is a 4,639-acre USAF installation under the command and control of AMC. McChord AFB is headquarters to the 62 AW. Major tenant units at the base include the 446th Airlift Wing (446 AW) of the Air Force Reserve Command (AFRC), the Washington Air Defense Squadron (WADS) of the Air National Guard (ANG), and the 22d Special Tactics Squadron (22 STS) of the Air Force Special Operations Command (AFSOC). The mission of the 62 AW is to provide rapid mobility for America's armed forces to any problem area in the world through airlift of troops and equipment. The 62 AW also provides administrative, medical, and logistical support to 62 AW units, tenant organizations, and the McChord AFB community including retirees and their families.

1.2 Purpose of and Need for the Proposed Action

The purpose of the Proposed Action is to implement installation development projects on McChord AFB as found in the community of existing Wing-approved plans for development on the installation. The community of installation development plans is linked to individual funding programs, such as Military Construction (MILCON), Operations and Maintenance (O&M), Military Family Housing (MFH), Anti-Terrorism/Force Protection (AT/FP), Nonappropriated Funds (NAF), and others. The McChord AFB community of plans was examined to provide a consolidated list of projects that are planned and programmed over the next 5 years for the continued physical development of the installation to support air mobility missions and other readiness training and operational assignments. These plans provide a vision for future development of the installation to accommodate future mission and facility requirements. These plans include projects for the installation's future facility development, transportation improvements, airfield and utility infrastructure enhancements, development constraints and opportunities, and land use relationships.



Source: ESRI StreetMap USA 2005

Figure 1-1. Location of McChord AFB, Washington

The need for the Proposed Action is to meet current and future mission requirements and national security objectives associated with McChord AFB. This involves meeting ongoing mission requirements that necessitate repairing and upgrading installation utilities, pavements, and facilities; improving the efficiency and effectiveness of forces with capability to expand; replacing older, substandard facilities with new buildings that are on a par with workplaces outside the gate; and providing reliable utilities, quality housing, and an efficient transportation system to support McChord AFB. In addition, morale and welfare projects that are a critical part of supporting the warfighter are included. Continued development of infrastructure at McChord AFB must take into account future facilities construction, demolition, and renovation; transportation needs; airfield alterations and enhancements; systems improvements; utilities improvements; land use planning; and development constraints and opportunities. Contributions by McChord AFB to national security, as well as prospects for the assignment of additional missions in the future, dictate that the installation implement planning for the next 5 years. To ensure complete readiness at the installation for any tasks assigned, infrastructure projects must take into account—and be capable of supporting—all functions inherent to a USAF installation. These include aircraft operations and maintenance activities, security, administration, communications, billeting, supply and storage, training, transportation, and community quality of life.

1.3 Scope of the Analysis

McChord AFB seeks to improve the continuing installation development process by evaluating in a single EA actions proposed in the McChord AFB Wing-approved community of plans for installation development. A compilation of projects from the McChord AFB Wing-approved community of installation development plans addressed in this IDEA is presented in **Appendix A**. Some of the projects identified in the McChord AFB community of installation development plans are appropriate for the application of Categorical Exclusions (CATEXs) and therefore are not analyzed in this IDEA. The scope of the EA includes an evaluation of alternatives for the various projects and an analysis of the cumulative effects on the natural and man-made environments. The Proposed Action includes numerous projects, such as demolition of aging facilities, new facility construction, facility upgrades, facility repair and renovation, utilities upgrades, community living upgrades, infrastructure upgrades, and recreational upgrades that could be completed or implemented during the next 5 years. The assessment compiles information on constraints that might inhibit development or dictate courses of actions affecting development; improve the facility planning process; and capture the Wing Commander's vision of what facilities and infrastructure improvements are necessary to support the installation's ongoing mission.

This IDEA evaluates the impacts of a Proposed Action that encompasses the continuing activities of demolition, construction, and infrastructure improvements inherent to McChord AFB adapting to ever-evolving mission requirements. This IDEA documents and evaluates the effects of currently identified activities involved in modernizing and upgrading McChord AFB to meet future requirements. The IDEA presents and analyzes potentially adverse direct, indirect, and cumulative environmental impacts resulting from implementation of McChord AFB's installation development (the Proposed Action) with emphasis on avoiding impacts on environmentally sensitive areas.

The scope of this IDEA includes an evaluation of the Proposed Action and alternatives, including the No Action Alternative, and an analysis of the cumulative effects on the natural and man-made environments of McChord AFB and surrounding areas. None of the projects contained in this IDEA, as part of the Proposed Action, would be sited in sensitive areas, such as wetlands, floodplains, threatened or endangered species habitat, or known archaeological sites.

The Proposed Action, as described in **Section 2**, contains three categories of installation development: demolition, construction, and infrastructure projects. These three categories were identified for use in this document because they allow the grouping of development initiatives by generally common elements of

their activity and the nature of their potential environmental impacts. Within each category, the IDEA analyzes in detail the environmental impacts resulting from the activities for a subset of representative projects to determine the range of potential impacts to be expected from projects within each group. These categories and the representative projects are described in **Sections 2.1.2**, **2.1.3**, and **2.1.4** and provide projects ranging in size, acreage disturbed, amounts of air emissions, increases in impervious surface, vegetation disturbed, and other relevant factors associated with environmental and socioeconomic resources. The IDEA also analyzes the siting of construction activities based on environmental constraints. All other projects listed in **Appendix A** are analyzed using the same methodology as applied to the representative projects and their impacts are summarized in tabular form in **Section 4.4.4** of the IDEA. The complete categorized lists of proposed projects that compose the Proposed Action can be found in **Appendix A**.

The collective analysis of appropriate projects in a single EA will streamline the NEPA review process; eliminate project fractionation and segmentation; facilitate coordination of land use planning; reduce installation, reviewing agency, and major command (MAJCOM) workloads; provide cost savings; help better evaluate potential cumulative environmental impacts; assist in maintaining a baseline for future analysis; and meet the USAF's EIAP goals.

1.4 Summary of Key Environmental Compliance Requirements

1.4.1 National Environmental Policy Act

The National Environmental Policy Act (commonly referred to as "NEPA") (42 United States Code [U.S.C.] Section 4321–4347) is a Federal statute requiring the identification and analysis of potential environmental impacts associated with proposed Federal actions before those actions are taken. The intent of NEPA is to help decision makers make well-informed decisions based on an understanding of the potential environmental consequences and take actions to protect, restore, or enhance the environment. NEPA established the Council on Environmental Quality (CEQ) that was charged with the development of implementing regulations and ensuring Federal agency compliance with NEPA. The CEQ regulations mandate that all Federal agencies use a prescribed structured approach to environmental impact analysis. This approach also requires Federal agencies to use an interdisciplinary and systematic approach in their decision making process. This process evaluates potential environmental consequences associated with a proposed action and considers alternative courses of action.

The process for implementing NEPA is codified in Title 40 Code of Federal Regulations (CFR), Parts 1500–1508, *Regulations for Implementing the Procedural Provisions of the National Environmental Policy Act*. The CEQ was established under NEPA to implement and oversee Federal policy in this process. The CEQ regulations specify that an EA be prepared to briefly provide evidence and analysis for determining whether to prepare a Finding of No Significant Impact (FONSI) or whether the preparation of an Environmental Impact Statement (EIS) is necessary. The EA can aid in an agency's compliance with NEPA when an EIS is unnecessary and facilitate preparation of an EIS when one is required.

Air Force Policy Directive (AFPD) 32-70, *Environmental Quality*, states that the USAF will comply with applicable Federal, state, and local environmental laws and regulations, including NEPA. The USAF's implementing regulation for NEPA is its EIAP, 32 CFR Part 989, as amended.

1.4.2 Integration of Other Environmental Statutes and Regulations

To comply with NEPA, the planning and decision making process for actions proposed by Federal agencies involves a study of other relevant environmental statutes and regulations. The NEPA process, however, does not replace procedural or substantive requirements of other environmental statutes and

regulations. It addresses them collectively in the form of an EA or EIS, which enables the decision maker to have a comprehensive view of major environmental issues and requirements associated with the Proposed Action. According to CEQ regulations, the requirements of NEPA must be integrated "with other planning and environmental review procedures required by law or by agency so that all such procedures run concurrently rather than consecutively."

The IDEA examines potential effects of the Proposed Action and alternatives on 11 areas: noise, land use, air quality, safety, geological resources, water resources, biological resources, cultural resources, socioeconomic resources and environmental justice, infrastructure, and hazardous materials and waste management. These were identified as being potentially affected by the Proposed Action and include applicable critical elements of the human environment that are mandated for review by Executive Order (EO), regulation, or policy. **Appendix B** contains examples of relevant laws, regulations, and other requirements that are often considered as part of the analysis. Where useful to provide the reader with better understanding, key provisions of the statutes and EOs are discussed in more detail in the text of the IDEA.

1.4.3 Interagency Coordination and Public Involvement

NEPA ensures that environmental information is made available to the public during the decision making process and prior to actions being taken. The premise of NEPA is that the quality of Federal decisions will be enhanced if proponents provide information on their actions to state and local governments and the public and involve them in the planning process. The Intergovernmental Coordination Act and EO 12372, *Intergovernmental Review of Federal Programs*, require Federal agencies to cooperate with and consider state and local views in implementing a Federal proposal. Air Force Instruction (AFI) 32-7060, *Interagency and Intergovernmental Coordination for Environmental Planning* (IICEP), requires the USAF to implement the IICEP process, which is used for the purpose of facilitating agency coordination and implements scoping requirements under NEPA.

HQ AMC sent a description of the Proposed Action and Alternatives to relevant Federal, state, and local agencies on May 29, 2007. Agencies were given an opportunity to provide any comments or information concerning the Proposed Action for 30 days during this initial scoping period. Two IICEP response letters were received. **Appendix C** includes the IICEP correspondence letter, distribution list, and the IICEP responses that were received.

1.5 Organization of the IDEA

This IDEA is organized into seven sections. **Section 1** contains background information on McChord AFB and the location of the Proposed Action, the purpose of and the need for the Proposed Action, the scope of the IDEA analysis, a summary of applicable regulatory requirements, and an introduction to the organization of the EA. **Section 2** provides a detailed description of the Proposed Action, alternatives to the Proposed Action that were considered, the No Action Alternative, and a description of the decision to be made and identification of the Preferred Alternative. **Section 3** contains a general description of the environmental and socioeconomic resources and baseline conditions that potentially could be affected by the Proposed Action, or the alternatives considered. **Section 4** presents an analysis of the environmental consequences for a range of activities (i.e., demolition, construction, and infrastructure projects to provide upgrades/replacements of facilities) covering future installation development. **Section 5** includes an analysis of the potential cumulative impacts on McChord AFB. **Section 6** lists the preparers of the document. **Section 7** is the reference section.

Appendix A presents a listing of proposed McChord AFB installation development projects compiled from the community of existing approved plans for the installation. **Appendix B** includes descriptions of

applicable laws, regulations, policies, and planning criteria. **Appendix C** includes a copy of the IICEP letter mailed to the agencies for this action, the IICEP distribution list, and responses to the IICEP letter. **Appendix D** contains example spreadsheets to show air quality emissions calculations for this Proposed Action.

2. Description of the Proposed Action and Alternatives

This section presents information on the Proposed Action related to the implementation of installation development, as described in the Wing-approved installation development plans. **Section 2.1** describes the Proposed Action at McChord AFB. **Section 2.2** identifies alternatives to the Proposed Action, including the No Action Alternative. **Section 2.3** identifies the decision to be made and the Preferred Alternative.

2.1 Proposed Action

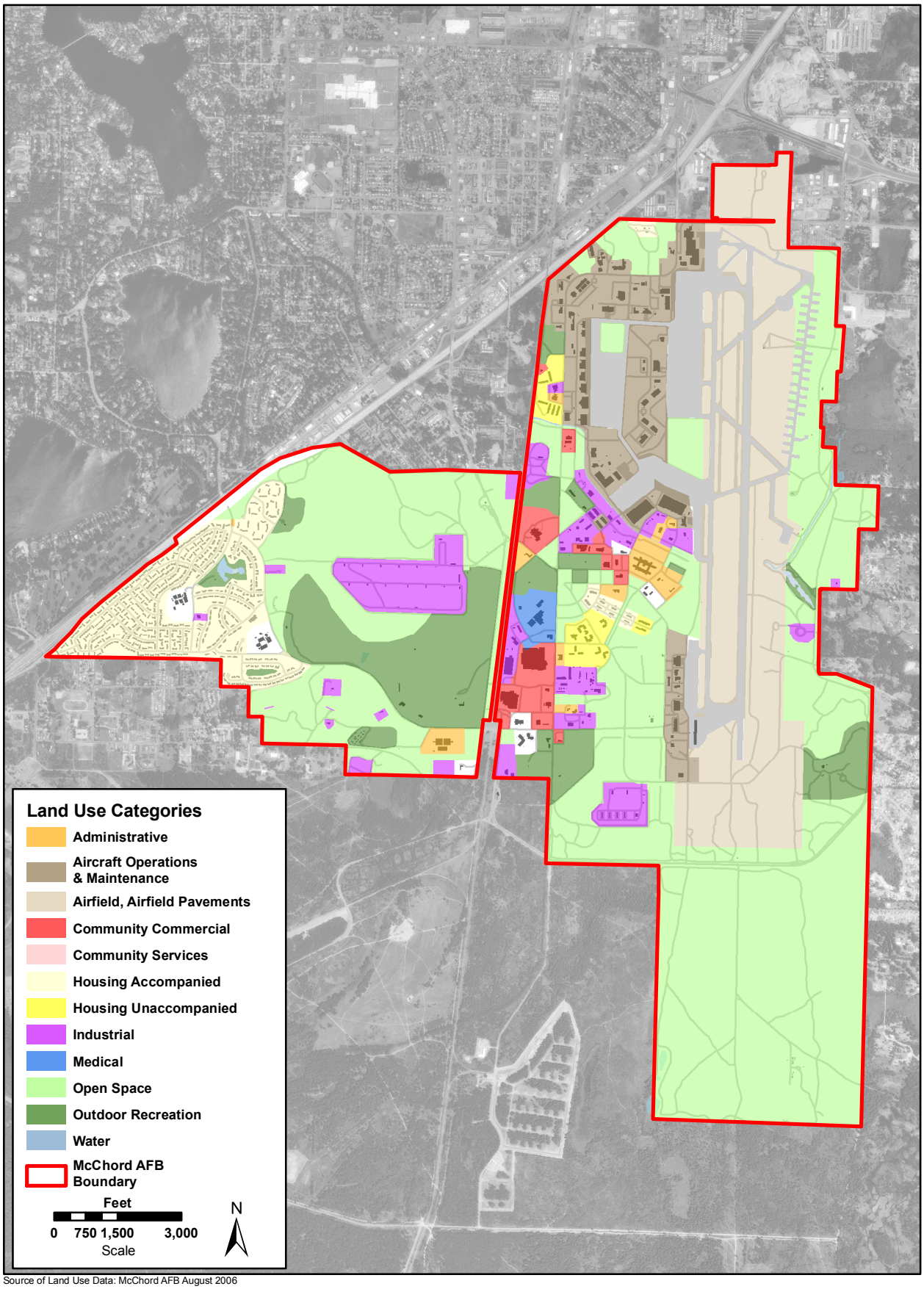
The Proposed Action is to implement numerous installation development projects as found in the community of plans for McChord AFB. It is intended that the projects contained in this IDEA will be reviewed during a 5-year rotational basis and this document might be updated to accommodate changes. If during the course of the next 5 years any of the projects listed in **Appendix A** change enough to be outside the scope of the analysis provided in this IDEA, the specified project would be excluded from the NEPA analysis represented by this IDEA without affecting other projects originally included in the IDEA.

This IDEA has been prepared using a constraints-based analysis (**Section 2.1.1**). This approach enables a comprehensive evaluation of environmental concerns throughout the installation and also those concerns unique to specific areas of McChord AFB. This analysis uses the information obtained from extensive recent EIAP evaluations for similar types of projects to determine the direct, indirect, and cumulative impacts of projects that would be completed as part of the installation's development plan.

The projects analyzed in the IDEA are categorized as demolition, construction, or infrastructure projects. For the purposes of describing the specific types of projects included as the Proposed Action, representative projects from each of the categories are listed in **Sections 2.1.2**, **2.1.3**, and **2.1.4**. These projects are considered to have the potential for the greatest impacts on the natural and man-made environments. The total suite of projects that make up the Proposed Action are listed in **Appendix A**. The total potential impacts associated with implementation of each of the projects in **Appendix A** are evaluated in this EA.

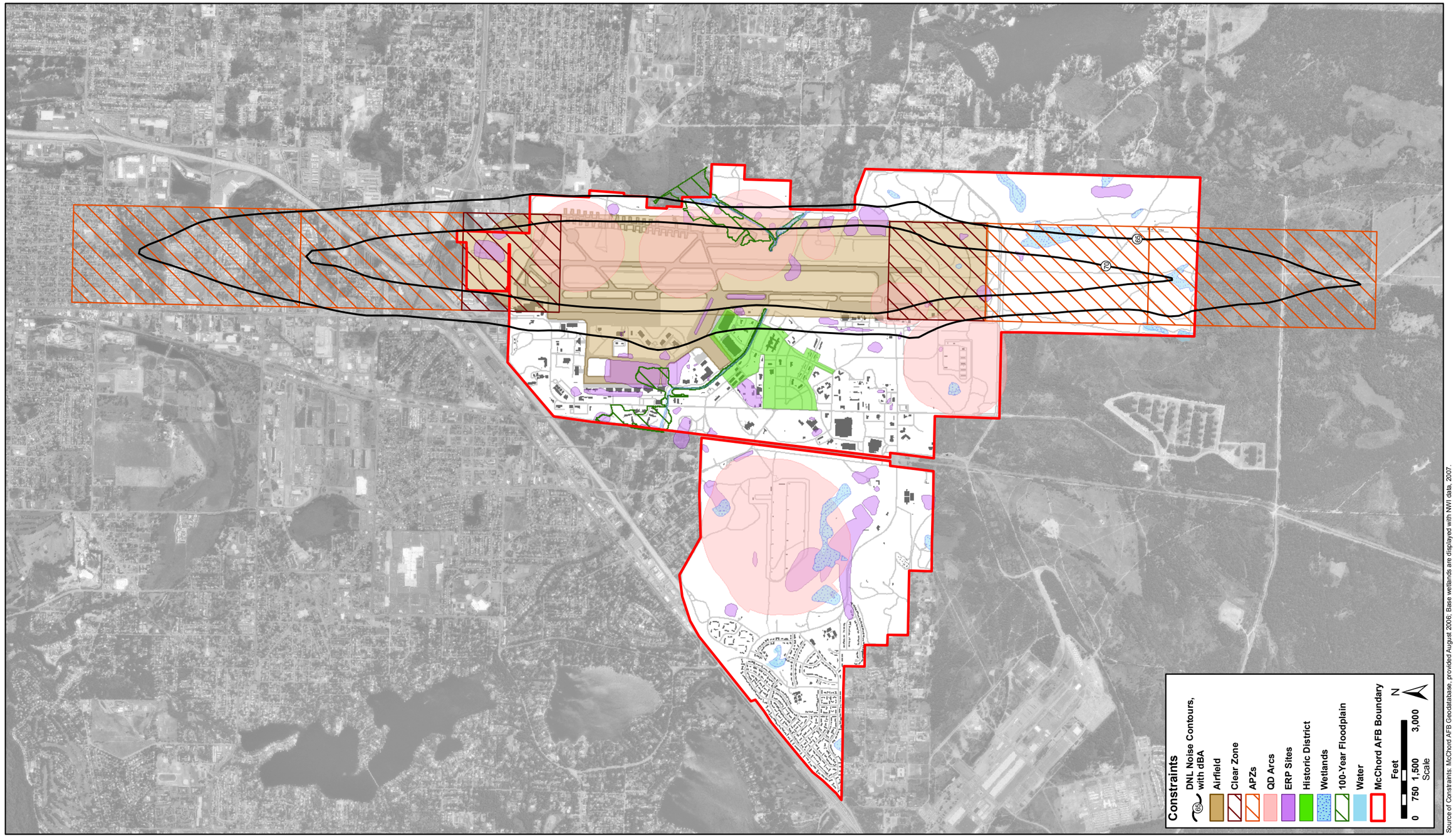
Each project would be sited in a manner compatible with surrounding land uses (see **Figure 2-1**) and would avoid sensitive or constrained areas (see **Figure 2-2**). Siting facilities with similar functions together and avoiding potential conflicts with already identified operational and environmental constraints supports the concept of sustainable installation development. The McChord AFB General Plan identifies the following land use categories (not including water as a category): Administrative, Aircraft Operations and Maintenance, Airfield and Aircraft Pavement, Community Commercial, Community Services, Housing Accompanied, Housing Unaccompanied, Industrial, Medical, Outdoor Recreation, Open Space, and Highway Right-of-Way. **Figure 2-1** shows the McChord AFB land use categories.

The exterior and interior design of the new facilities would follow the design guidelines outlined in the *Air Mobility Command Civil Engineering Squadron Design Guide* and the *McChord AFB Architectural Compatibility Guide.* This guidance helps to ensure a consistent and coherent architectural character throughout McChord AFB. Landscaping would be used to provide an attractive and professional-looking installation by using plants, shrubs, and trees to blend with the surrounding environment. AT/FP measures would be incorporated in accordance with the *Department of Defense Minimum Antiterrorism Standards for Buildings* and *USAF Installation Force Protection Guide*. All construction would comply with applicable building, fire, and safety codes. The proposed construction projects would be implemented using sustainable design concepts. Sustainable design concepts emphasize state-of-the-art strategies for site development, efficient water and energy use, and improved indoor environmental quality.



Source of Land Use Data: McChord AFB August 2006

Figure 2-1. McChord AFB Land Uses



Source of Constraints: McChord AFB Geodatabase, provided August 2006; Base wetlands are displayed with NWI data, 2007.

Figure 2-2. McChord AFB Constraints Map

All projects identified as part of the Proposed Action in this IDEA would avoid sensitive areas. The precise layout and design of projects are in the early planning stages and, therefore, exact surveyed locations and layouts are not finalized. Should locations and final layouts of the projects differ substantially from those anticipated (e.g., in location, layout, or potential environmental consequences), additional environmental analysis would be completed. If it is determined that future projects outside the scope of this IDEA would impact sensitive resources, then separate environmental analysis on those projects would be required.

2.1.1 Major Installation Constraints

There are a number of land use, regulatory, and mission-related constraints within the boundaries of McChord AFB that will influence and could limit future development. The major constraints on McChord AFB are depicted in **Figure 2-2** and discussed in the bulleted paragraphs below. The electronic mapping data from McChord AFB's Geographical Information System (GIS) database (also called the GeoBase system) was used to quantify the major known constraints to installation development. The acreages for each constraint were calculated using the assumptions identified by the notes to this bulleted list and relied on the data from GeoBase system, unless another source document is indicated. Some constraint areas overlap and therefore the acreages shown do not equal the total acreage constrained for McChord AFB. The acreage calculations do not include the portions of the constraint areas that extend off the installation.

- ***Airfield Infrastructure and Clear Zones (2,048 acres).*** The airfield includes pavement, runway, overrun, taxiway, apron and ramp, and arm/disarm pads (1,240 acres[1]). Clear zones are obstruction-free surfaces on the ground beginning at the end of the runway and extending outward 3,000 feet for the width of the runway (360 acres[2]). These areas defined as the airfield are absolute constraints to development; only airfield improvements and projects directly associated with airfield operations occur on these areas of the installation. All projects within this area must be approved by the Facility Utilization Board (FUB) and airfield management prior to commencing any construction-related activities. Accident potential zone (APZ) I occurs at the ends of the clear zone and extends for 5,000 feet, and APZ II occurs at the ends of APZ I and extends for 7,000 feet for the width of the runway (448 acres[3]). APZs frequently extend past installation boundaries; development within APZs is discouraged.
- ***Noise Zones (1,727 acres).*** Aircraft operations are a dominant component of the noise environment at McChord AFB. USAF, Federal Aviation Administration (FAA), and the U.S. Department of Housing and Urban Development (HUD) criteria specify that noise levels in noise-sensitive land use areas are normally considered unacceptable where noise levels exceed a day-night average sound level (DNL) of 65 A-weighted decibels (dBA). McChord AFB restricts development to compatible uses when noise levels exceed a DNL of 65 dBA.
- ***Munitions and Other Safety Criteria (1,060 acres).*** There are a number of areas constrained by quantity-distance (QD) zones at McChord AFB. There are two weapons storage areas (1,250-

Notes:

[1] Acreage constrained by the airfield was determined using the area of the runways and airfield pavements in the McChord AFB GeoBase data and adding 1,500 feet from the runway centerline for the length of the runway as a buffer.
[2] Each clear zone is (by definition) 3,000 feet by 3,000 feet (on each end of the runway), or a total of approximately 413 acres. At McChord AFB, the north clear zone extends past installation boundaries so that portion is not included in total acres constrained.
[3] APZ I and APZ II combined are (by definition) 3,000 feet by 12,000 feet (on each end of the runway), or a total of approximately 1,650 acres. Most of this area extends beyond installation boundaries so that portion is not included in total acres constrained.

foot QD zones), three hot cargo pads (1,250-foot QD zones), and an Explosive Ordnance Disposal (EOD) pit (500-foot QD zone). Development functions must be coordinated with the 62d Airlift Wing/Weapons Safety Office (62 AW/SEW) to ensure compatibility with the QD zones.

- ***Environmental Restoration Program (ERP) Sites and Environmental Land Use Controls (243 acres).*** McChord AFB manages 65 sites under its ERP; all sites have remediation under way or no further action planned. Seven ERP sites comprise the Area D/American Lake Garden Tract, which is on the U.S. Environmental Protection Agency's (USEPA) National Priorities List. New facilities can be constructed within certain ERP sites depending upon the level of contamination, clean-up efforts, and land use controls. Approval of new construction within ERP sites must be obtained from the FUB and coordinated with the 62d Civil Engineering Squadron/Environmental Flight (62 CES/CEV).
- ***Wetlands (138 acres).*** It is USAF policy to avoid constructing new facilities within areas containing wetlands, where practicable. To construct within areas containing wetlands, appropriate permits from county, state, and Federal regulatory agencies must be obtained. In addition, in accordance with EO 11990, a Finding of No Practicable Alternative (FONPA) must be prepared and approved by HQ AMC. McChord AFB has approximately 138 acres of wetlands (62 CES/CEV 2003a). None of the projects analyzed in this IDEA would occur in wetlands.
- ***100-Year Floodplain (102 acres).*** It is USAF policy to avoid constructing new facilities within the 100-year floodplain in order to protect the functions of floodplains, minimize the potential damage to facilities, and ensure the safety of working personnel. Should construction within the 100-year floodplain be considered, a FONPA must be obtained and the project must be approved by HQ AMC. McChord AFB has approximately 102 acres of land within the 100-year floodplain (62 CES/CEV 2003a). None of the projects analyzed in this IDEA would occur in the floodplain.
- ***Threatened and Endangered Species and Sensitive Habitats.*** There is one federally threatened species, water howellia, that is known to occur on McChord AFB, and other protected species or species of concern that could occur (see **Section 3.7.2**). Construction within critical habitat for threatened or endangered species must be approved by the U.S. Fish and Wildlife Service (USFWS), the Washington Department of Fish and Wildlife (WDFW), and 62 CES/CEV. In addition, a Biological Opinion from the USFWS, as required under Section 7 of the Endangered Species Act (ESA) of 1973, must be obtained prior to commencing construction activities affecting federally protected species. The WDFW considers the prairie, white (Garry) oak woodlands, and lowland coniferous forest ecosystems to be of state significance. McChord AFB has identified approximately 372 acres of Garry oak or ponderosa pine stands (62 CES/CEV 2003a). Removal of trees or alteration of these habitats must be approved by the 62 CES/CEV.
- ***Cultural Resources, Historic Buildings, and Archaeological Sites.*** McChord AFB has many cultural resources considered eligible for inclusion in the National Register of Historic Places (NRHP), including one historic district that has been nominated for the NRHP (147 acres, shown on **Figure 2-2**), three individually historic structures, and one Cold War-era structure (MAFB 2004). Activities potentially affecting cultural resources are coordinated with the Washington Department of Archaeology and Historic Preservation as the State Historic Preservation Office (SHPO)[4], FUB, and 62 CES/CEV.

[4] Section 106 consultation with the SHPO under the provisions of the National Historic Preservation Act would occur prior to commencement of site-specific construction or demolition activities. This IDEA is not intended to initiate or be a substitute for formal Section 106 consultations.

- ***AT/FP Setback Requirements.*** Minimum AT/FP design standards for new construction have been specified by the Department of Defense (DOD) and increase the land area required for individual facilities. Design standards for new construction are contained in Unified Facilities Criteria (UFC) 4-010-01, *Department of Defense Minimum Antiterrorism Standards for Buildings*, October 2003, and augmented by USAF instructions. The USAF Force Protection Design Guide, published by the Air Force Center for Environmental Excellence, supplements the DOD standards and must also be consulted during the planning and design processes.

As a general practice, McChord AFB seeks to avoid, wherever possible, any disturbance to sensitive areas, such as wetlands and floodplains. However, as future mission activities dictate, and due to the expanse of constrained areas on McChord AFB, avoiding or restricting future development within this acreage might not be practical and could limit the installation's ability to successfully accomplish its missions. When these resources cannot be avoided, separate and additional NEPA documentation would occur and coordination with the appropriate regulatory agencies would be completed prior to initiating the action. All construction and other activities that would occur in these areas would comply with the requirements of the various local, state, and Federal policies and regulations that govern such resources.

2.1.2 Demolition Projects

McChord AFB proposes 18 facility demolition projects that could be implemented in the next 5 years to support its future mission requirements (see **Table A-1** in **Appendix A**). Demolition activities would remove an estimated 469,000 square feet (ft^2) of facilities, making space available for future development. These facilities have been deemed too costly to repair or renovate to meet the future mission requirements of McChord AFB. Projects within this category include primarily the demolition of structures, but could also include demolition of parking and other pavements if they would be demolished together. The demolition of old or outdated facilities would minimize the area of undisturbed land required for new facilities. **Table 2-1** identifies projects that would be representative of the types of demolition projects proposed for implementation. These demolition projects have been selected for further analysis because they are considered to have the highest potential to impact the natural and man-made environments, and therefore are representative of the upper limits for potential impacts that

Table 2-1. Representative Demolition Projects

Project Identification Number and Title	Fiscal Year	Area Demolished (ft^2)
D1. Demolish Existing Base Engineering Facilities (Buildings 529, 533, 535, 536, 537, 538, 540, 541, 561, 562, 563, and 24011) and pavements in support of the construction of the Base Engineering Complex	2014+	255,500
D2. Demolish Visiting Airmen's Quarters (Buildings 595, 596, and 597 *) concurrent with construction of a 144-person dormitory (Phase 1)	2009	32,160
D3. Demolish Health and Wellness Center (Building 726), Outdoor Pool (81201), and Bath House (Building 736) in support of the construction of a Physical Fitness Center	2008–2013	25,200

Notes:

* These facilities are identified in the project list in Appendix A with individual project numbers.

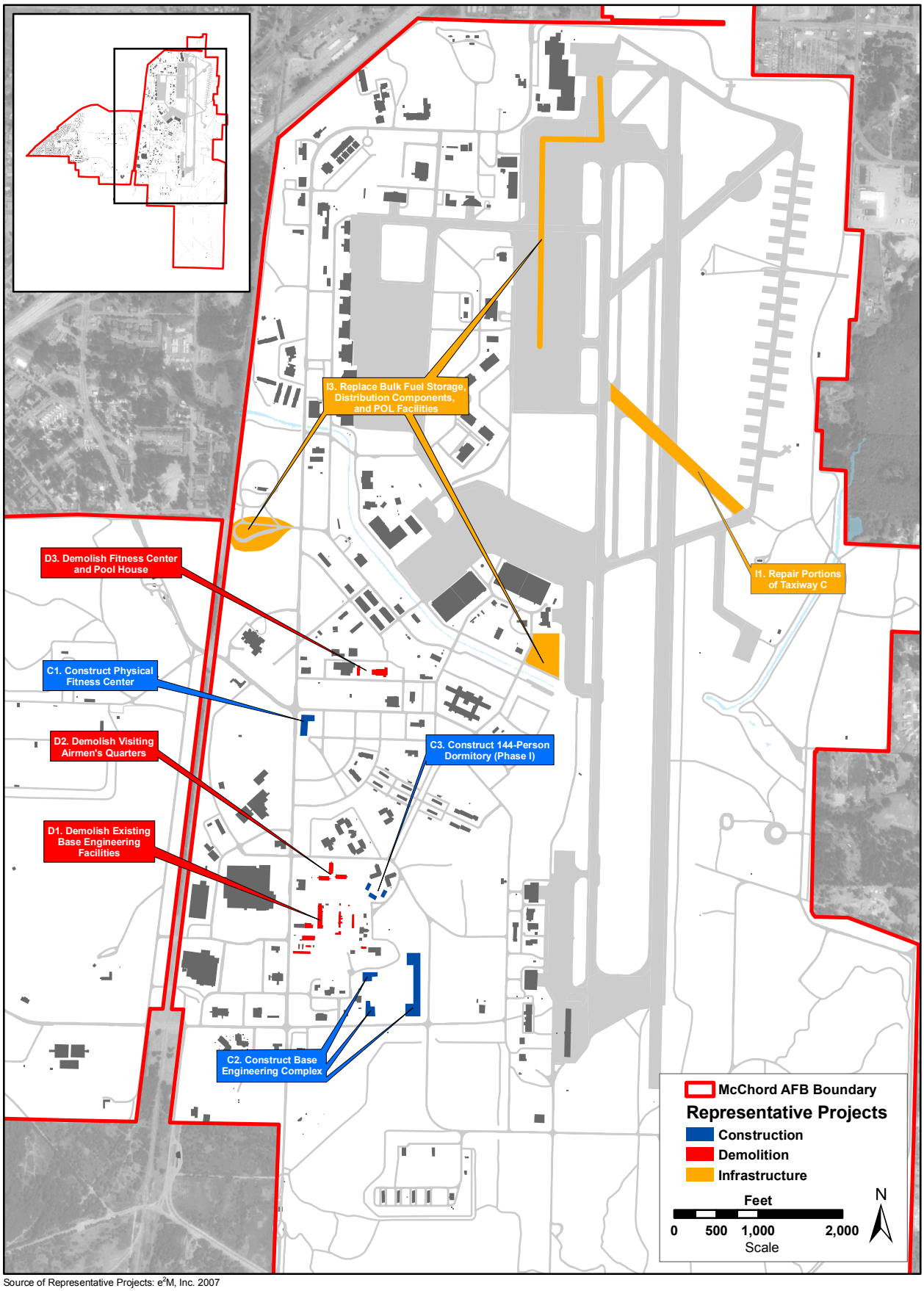
reasonably could be expected from the other projects in the demolition projects category. For example, demolitions of multiple facilities in support of large MILCON construction actions are typically the largest demolition projects. While it is probable that the demolition of multiple facilities would be funded individually, these facilities are grouped together for the purposes of this IDEA to match the planned approach that is expected for McChord AFB. Demolition in support of the Base Engineering Complex and associated pavements, the 144-person dormitory (Phase 1 of a three-phase project), and the Physical Fitness Center were selected because these three large MILCON construction initiatives have associated large demolition projects. These three projects were selected over other large projects because they are three of the top five MILCON priorities for the installation. **Figure 2-3** shows the locations of the three projects proposed for demolition that are presented for analysis as representative projects in this IDEA.

2.1.3 Construction Projects

McChord AFB proposes 24 construction projects that could be implemented in the next 5 years to support its future mission requirements and to comply with force protection criteria (see **Table A-2** in **Appendix A**). Construction activities would disturb an estimated 890,000 ft^2 of land. Projects within this category include primarily new facility construction and additions to existing facilities, but could also include renovations, repairs, alterations, parking, and other pavements when these elements are a relevant component of a facility construction project. The construction of new facilities would be zoned in accordance with appropriate land use areas in order to continue or enhance compatibility with currently designated land use areas. **Table 2-2** identifies projects that would be representative of the types of construction projects proposed for development. These construction projects have been selected for analysis in the IDEA because they are believed to be representative of the upper range of such projects and would have the highest potential to impact the natural and man-made environments, and therefore are representative of the upper limits for potential impacts that reasonably could be expected from the other projects in the construction projects category. For example, three large proposed construction projects at McChord AFB are the construction of a Physical Fitness Center, construction of a Base Engineering Complex, and construction of a 144-person dormitory (Phase 1). These projects have the potential to create surface disturbance. The Physical Fitness Center is within the boundaries of the McChord Field Historic District, so it has the potential to affect the character and historical qualities of the district. The Physical Fitness Center and the Base Engineering Complex would be constructed in what is currently open space land use, so some vegetation removal would be necessary. These three projects were selected over other large projects because they are three of the top five MILCON priorities for the installation. **Figure 2-3** shows the locations of the three projects proposed for construction that are presented for analysis in this IDEA.

Table 2-2. Representative Construction Projects

Project Identification Number and Title	Fiscal Year	Area Constructed (ft^2)
C1. Construct a Physical Fitness Center	2008–2013	94,200
C2. Construct a Base Engineering Complex composed of three buildings (a grounds facility, a maintenance facility, and a storage facility) (74,700 ft^2) and associated pavements (148,100 ft^2)	2014+	222,800
C3. Construct a 144-person Dormitory (Phase 1)	2014+	57,500



Source of Representative Projects: e^{2}M, Inc. 2007

Figure 2-3. Locations of Representative Demolition, Construction, and Infrastructure Projects

2.1.4 Infrastructure Projects

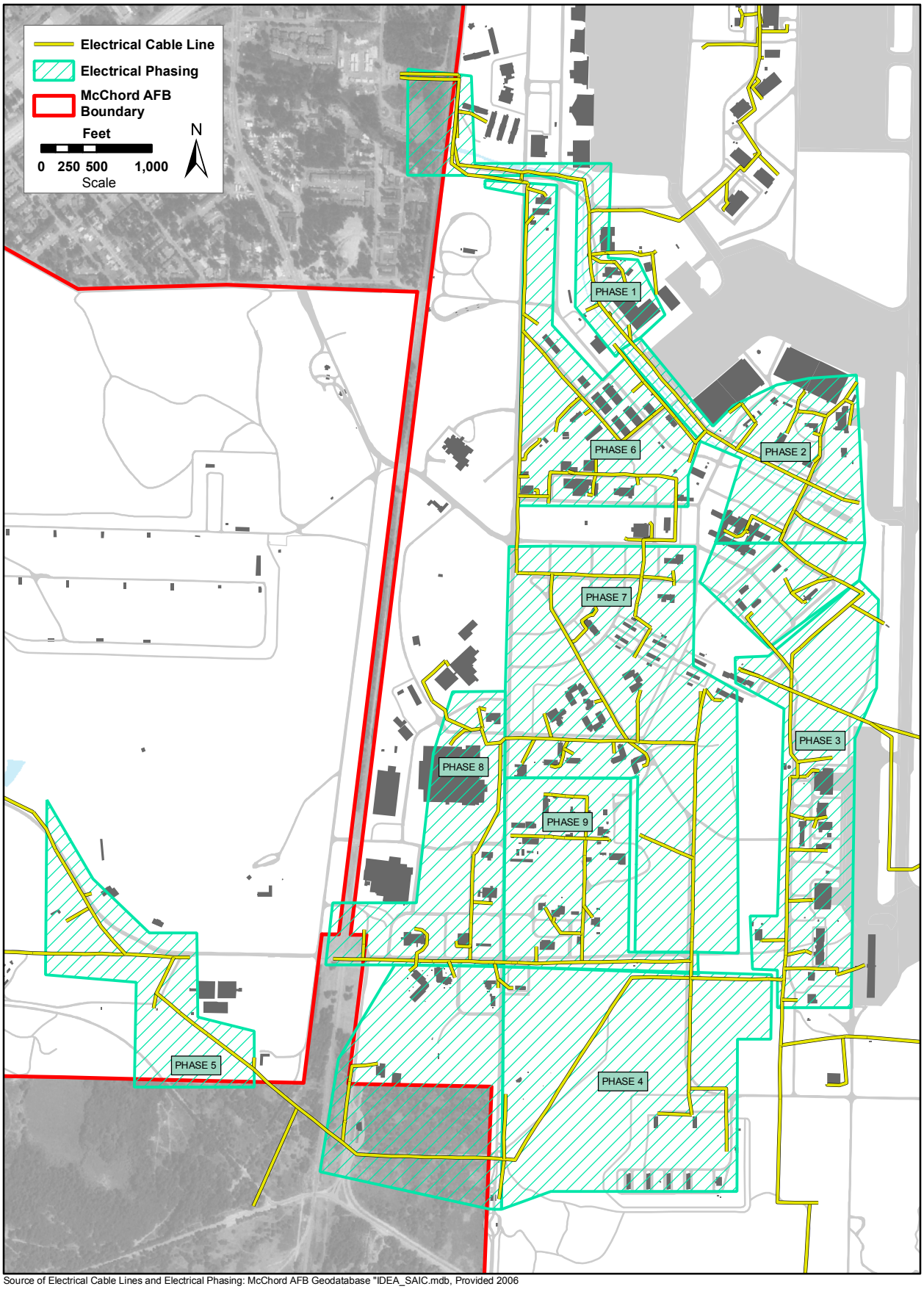
McChord AFB proposes 24 infrastructure projects that could be implemented in the next 5 years to support future mission requirements and to comply with force protection criteria (see **Table A-3** in **Appendix A**). Infrastructure projects would disturb an estimated 3.8 million ft^2 of land. Projects within this category include the removal or installation of or upgrades to paved roadways, sidewalks, parking lots, utilities, storm water systems, fences, and recreational facilities. **Table 2-3** identifies projects that are believed to be representative of the types of infrastructure upgrade projects proposed. These representative facility infrastructure projects have been selected for further analysis in the IDEA because they are believed to be representative of the upper range of potential impacts on the natural and man-made environment from such projects and thus frame the upper limits for potential impacts that reasonably could be expected from other projects in the infrastructure category. Most infrastructure projects would require the use of heavy machinery, which would result in air emissions; larger projects would likely have the greatest potential to affect air quality. For example, airfield pavements repair includes milling the surface of the pavement and repaving large areas. The proposed repair of Taxiway C is considered representative of the kinds of airfield improvements that have the potential to result in environmental impacts. The replacement of overhead electrical distribution with underground electrical distribution would result in ground disturbance over many land uses and could affect potentially sensitive areas. The replacement of the bulk fuel storage and distribution components would include many components to upgrade the JP-8 fuel system in three areas of the installation, including replacement of petroleum, oil, and lubricant (POL) operations and laboratory facilities. These three projects have been selected because they are considered large-scale but representative of the types of ongoing infrastructure upgrades that have the potential to affect the environment. **Figure 2-3** shows the locations of Projects I1 and I3, and **Figure 2-4** shows the general location for Project I2.

Table 2-3. Representative Infrastructure Projects

Project Identification Number and Title	Fiscal Year	Project Size (ft^2)
I1. Repair portions of Taxiway C	2009	2,280,000
I2. Replace overhead electrical distribution with underground distribution	2007+	300,000
I3. Replace bulk fuel storage and distribution components and POL facilities	2009	392,000

2.1.5 Summary of Proposed Activities

As a result of full implementation of the Proposed Action (including all projects identified in **Appendix A**), there would be approximately 468,760 ft^2 of buildings demolished, resulting in a decrease of impervious surface of approximately 449,370 ft^2. Over the course of the next 5 years, there would be approximately 889,690 ft^2 of new facilities constructed, resulting in an anticipated increase of 750,940 ft^2 of impervious surface (some of the facilities would be multiple levels). Additionally, there would be infrastructure upgrades and improvements. These infrastructure projects would disturb 3,782,310 ft^2 of area and increase impervious surfaces by approximately 117,950 ft^2. **Table 2-4** summarizes these anticipated changes.



Source of Electrical Cable Lines and Electrical Phasing: McChord AFB Geodatabase "IDEA_SAIC.mdb, Provided 2006

Figure 2-4. Location of Representative Infrastructure Project I2

Table 2-4. Change in Impervious Surfaces

Project Type	Total Project Area	Change in Impervious Surfaces
Demolition	468,760 ft^2	–449,370 ft^2
Construction	889,690 ft^2	+750,940 ft^2
Infrastructure	3,782,310 ft^2	+117,950 ft^2
Total	**5,140,760 ft^2 (118 acres)**	**+419,520 ft^2 (+10 acres)**

Note: Change in impervious surface is not necessarily equivalent to the project area square footage because some facilities proposed for demolition are multiple stories, and many new facilities would be multiple stories. Furthermore, some infrastructure projects would include removal of pavements, or would disturb area but not add impervious surfaces.

2.2 Alternatives

During development of the McChord AFB installation development plans and during the project siting phase, alternative locations for construction and infrastructure projects were evaluated and the best possible solution for project siting was selected based on numerous criteria (e.g., functional requirements, collocation of like services, and availability of sites). Based on this evaluation, the proposed locations for each of the construction and infrastructure projects were determined to be the best available (see **Figures 2-3** and **2-4**). With respect to alternatives for the demolition projects, each of these were also evaluated for potential reuse options and none were considered suitable for reuse.

All of the IDEA projects are evaluated individually and cumulatively in this IDEA to determine if the consequences of implementation would cause substantive impacts on the human and natural environments of McChord AFB and surrounding areas. Subsets of projects, considered as alternatives, were not carried forward for further independent analysis based on the determination that subsets would not cause any additional impacts beyond that of the Proposed Action.

The individual projects would be prioritized and implemented as funding becomes available. The Proposed Action encompasses all the currently identified projects and the analysis describes the specific and cumulative consequences of implementing the IDEA plan. Since project phasing is expected to occur, based on the availability of funding, no phasing alternatives were carried forward for independent analysis.

2.2.1 Alternative 1 – Acquire Additional Land Surrounding McChord AFB

Under this alternative, McChord AFB would purchase suitable land outside of its present boundaries to construct some of the facilities needed for future mission requirements. The DOD is attempting to dispose of as many acres as possible of underutilized land at many installations in the United States, so acquisition of land for development purposes is discouraged. Land use surrounding McChord AFB limits the potential to expand USAF property. Moderate- to high-density residential, commercial, and some industrial uses are along the eastern, northern, northwestern, and partly the southern boundaries. Fort Lewis is contiguous with the remainder of the southern boundary. The Interstate Highway 5 (I-5) corridor is also adjacent to the northwestern boundary. For these reasons, this alternative is not considered viable and is eliminated from further detailed analysis in the IDEA.

2.2.2 Alternative 2 – Lease Additional Facilities in the Surrounding Community

Under this alternative, McChord AFB would lease office and warehouse space in the surrounding private sector community to house personnel and provide space for mission operations. This alternative would result in an insufficient span of control for the command and control function. The leased facilities would have great limitations in their ability to meet the DOD force protection requirements, resulting in high additional costs or noncompliance with force protection requirements. This alternative is not considered viable and is eliminated from further detailed analysis in the IDEA.

2.2.3 No Action Alternative

CEQ regulations require consideration of the No Action Alternative for all proposed actions. The No Action Alternative serves as a baseline against which the impacts of the Proposed Action and other potential alternatives can be compared and consequently it is carried forward for further evaluation in this IDEA.

Under the No Action Alternative, the 62 AW would not implement the projects proposed in the installation's community of plans. In general, implementation of the No Action Alternative would require that the 62 AW continue to operate under substandard, inefficient, and in some cases, unsafe conditions. Under the No Action Alternative, these deficiencies would impair the 62 AW's future ability to successfully sustain current and future national security objectives and other mission requirements.

Through implementation of the No Action Alternative, future installation development projects would continue to be evaluated for potential effects on an individual project basis. The preparation of separate NEPA documents would be required for each project to evaluate potential environmental consequences. This alternative will be carried forward for analysis as a baseline against which the impacts of the Proposed Action and potential alternatives can be evaluated.

2.3 Decision to be Made and Identification of the Preferred Alternative

In this IDEA, McChord AFB will evaluate whether the Proposed Action would result in any significant impacts. If such impacts are predicted, McChord AFB would provide mitigation to reduce impacts to below the level of significance, undertake the preparation of an EIS addressing the Proposed Action, or abandon the Proposed Action. The EA will also be used to guide McChord AFB in implementing the Proposed Action in a manner consistent with USAF standards for environmental stewardship. The Preferred Alternative for the Proposed Action is set forth in **Section 2.1**.

3. Affected Environment

This section describes the environmental and socioeconomic resources and conditions most likely to be affected by the Proposed Action and provides information to serve as a baseline from which to identify and evaluate environmental and socioeconomic consequences likely to result from implementation of the Proposed Action. Baseline conditions represent current conditions. In compliance with NEPA, CEQ guidelines, and 32 CFR Part 989, as amended, the description of the affected environment focuses on those resources and conditions potentially subject to impacts.

3.1 Noise

3.1.1 Definition of the Resource

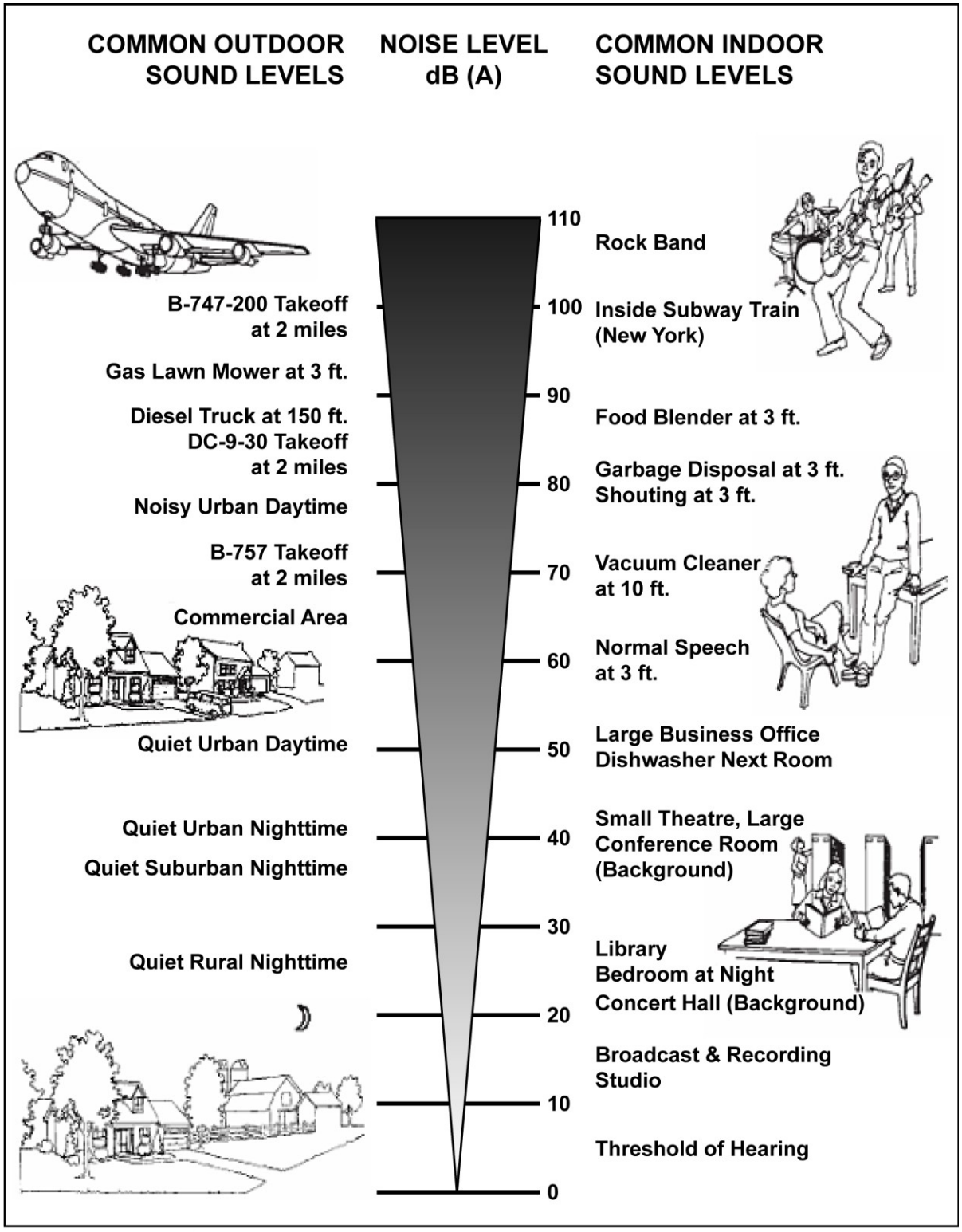
Noise and sound share the same physical aspects, but noise is considered a disturbance while sound is defined as an auditory effect. Noise is defined as any sound that is undesirable because it interferes with communication, is intense enough to damage hearing, or is otherwise annoying. Human response to increased noise levels varies according to the source type, characteristics of the noise source, distance between source and receptor, receptor sensitivity, and time of day.

Sound is measured with instruments that record instantaneous sound levels in decibels (dB). A-weighted sound level measurements (dBA) are used to characterize sound levels that can be sensed by the human ear. "A-weighted" denotes the adjustment of the frequency content of a noise event to represent the way in which the average human ear responds to the noise event. All sound levels analyzed in this EA are A-weighted.

Noise levels, which result from multiple single-events, are used to characterize community noise effects from aircraft operations and are measured in DNL. The DNL metric provides the energy-averaged sound level measured over a 24-hour period, with a 10-dB penalty assigned to noise events occurring between 10:00 p.m. and 7:00 a.m. This noise metric incorporates a "penalty" for nighttime noise events to account for increased annoyance. DNL values are obtained by averaging sound exposure level values for a given 24-hour period. DNL is the preferred noise metric of HUD, FAA, USEPA, and DOD for modeling airport environs.

Most people are exposed to sound levels of a DNL of 50 to 55 dBA or higher on a daily basis. Noise levels in residential areas vary depending on the housing density and location. As shown in **Figure 3-1**, a normal suburban area is about 55 dBA, which increases to 60 dBA for an urban residential area and 80 dBA in the downtown section of a city.

Construction Sound Levels. Building construction, modification, and demolition work can cause an increase in sound that is well above the ambient level. A variety of sounds are emitted from graders, pavers, trucks, welders, and other work activities and processes. **Table 3-1** lists sound levels associated with common types of construction equipment. These sound levels were predicted 50 feet from the source of the noise. Construction equipment usually exceeds the ambient sound levels by 20 to 25 dBA in an urban environment and up to 30 to 35 dBA in a quiet suburban area.



Source: Landrum & Brown 2002

Figure 3-1. Typical Noise Levels

Table 3-1. Predicted Noise Levels for Construction Equipment

Construction Category and Equipment	Predicted Noise Level at 50 feet (dBA)
Grading	
Bulldozer	87
Grader	85
Water Truck	88
Paving	
Paver	89
Roller	74
Demolition	
Loader	85
Haul Truck	88
Backhoe	83
Building Construction	
Generator Saw	81
Industrial Saw	83
Welder	74
Truck	80
Forklift	67
Crane	83

Source: COL 2001

3.1.2 Existing Conditions

The ambient noise environment around McChord AFB is affected mainly by military aircraft operations and automobile traffic.

The 62 AW and 446 AW operate the C-17 aircraft, which is the only aircraft based at McChord AFB. In 1998, an *Air Installation Compatible Use Zone (AICUZ)* study was completed for McChord AFB (MAFB 1998). This study shows the DNL of 65, 70, and 75 dBA noise contours extending beyond the base boundary to the north and south of McChord AFB. Land use in the 1998 AICUZ study consisted of residential, commercial, and public areas to the north of the installation and public (Fort Lewis Military Reservation) to the south. Recent aerial photography indicates that several areas to the north of McChord AFB have shifted from commercial to industrial land uses.

McChord AFB is southeast of I-5, south of State Route 512, and west of State Route 7. Since I-5 and State Route 512 are adjacent to the installation, traffic on these roads contributes to the ambient noise environment around McChord AFB.

Considering the military aircraft operations and automobile traffic at and adjacent to McChord AFB, the ambient sound environment around the installation is likely to resemble an urban atmosphere.

3.2 Land Use

3.2.1 Definition of the Resource

The term "land use" refers to real property classifications that indicate either natural conditions or the types of human activity occurring on a parcel. In many cases, land use descriptions are codified in local zoning laws. There is, however, no nationally recognized convention or uniform terminology for describing land use categories. As a result, the meanings of various land use descriptions, "labels," and definitions vary among jurisdictions.

Natural conditions of property can be described or categorized as unimproved, undeveloped, conservation or preservation area, and natural or scenic area. There is a wide variety of land use categories resulting from human activity. Descriptive terms often used include residential, commercial, industrial, agricultural, institutional, and recreational.

Two main objectives of land use planning are to ensure orderly growth and compatible uses among adjacent property parcels or areas. Compatibility among land uses fosters the societal interest of obtaining the highest and best uses of real property. Tools supporting land use planning include written master plans/management plans and zoning regulations. In appropriate cases, the locations and extent of proposed actions need to be evaluated for their potential effects on the project site and adjacent land uses. The foremost factor affecting a proposed action in terms of land use is its compliance with any applicable land use or zoning regulations. Other relevant factors include matters such as existing land use at the project site, the types of land uses on adjacent properties and their proximity to a proposed action, the duration of a proposed activity, and its "permanence."

In the context of aircraft operations, land use compatibility is also described in terms of safety/clearance zones and noise levels. Clear zones; APZs; and runway, taxiway, and apron clearances are areas with restricted uses due to aircraft operations. **Section 3.1** describes noise levels relative to land use in the vicinity of McChord AFB.

3.2.2 Existing Conditions

Land use categories at McChord AFB include Administrative, Aircraft Operations and Maintenance, Aircraft Pavement, Airfield, Community Commercial, Community Service, Housing Accompanied, Housing Unaccompanied, Industrial, Medical, Open Space, Outdoor Recreation, and Highway Right-of-Way (see **Figure 2-1**) (62 AW 2005a). The airfield and associated land uses are on the eastern and northern sides of the installation. The majority of the residences (Housing Accompanied) are on the western side of McChord AFB. The center of the installation consists of Administrative, Community, Unaccompanied Housing, and Medical uses, along with a historic district.

Land surrounding McChord AFB consists primarily of commercial, industrial, residential, open space, and military use. To the north of McChord AFB, land consists mainly of industrial and commercial use; to the northwest there is primarily residential use; to the east is mainly open space and residential; and to the west is open space, residential, commercial, and industrial areas. Fort Lewis Military Reservation borders McChord AFB to the south. Fort Lewis consists of 87,000 acres and employs more than 25,000 soldiers and civilian workers. In addition, Fort Lewis supports more than 120,000 retirees and 29,000 family members that live on and off the installation (Global Security 2007).

Recreational areas around McChord AFB include Lake Spanaway Golf Course, Spanaway Park/Bresemann Forest, H. Sprinkler Recreation Center, Gonyea County Park, and University Golf Course to the east of the installation. Whispering Firs Golf Course, Tacoma Country Club and Golf Club,

Harry Todd Park, Lakeland County Park, Lakewood Gardens, and Lakewood Active Park are west of McChord AFB.

The General Plan for McChord AFB was completed in 2005 (62 AW 2005a). The General Plan assesses significant natural, cultural, environmental, man-made, and operational conditions that could impact facility development at McChord AFB and describes the implementation of short-term and long-term development. Under the General Plan, Industrial land would be consolidated, there would be an expansion of Community Service land use, Accompanied Housing would be privatized, old dorms would be demolished as new dorms are created, and several Outdoor Recreation facilities would be built. These actions would lead to an overall decrease in Open Space. Airfield, Aircraft Operations and Maintenance, Community, and Medical land uses would not be change significantly.

3.3 Air Quality

3.3.1 Definition of the Resource

In accordance with Federal Clean Air Act (CAA) requirements, the air quality in a given region or area is measured by the concentration of various pollutants in the atmosphere. The measurements of these "criteria pollutants" in ambient air are expressed in units of parts per million (ppm), milligrams per cubic meter (mg/m^3), or micrograms per cubic meter ($\mu g/m^3$). The air quality in a region is a result not only of the types and quantities of atmospheric pollutants and pollutant sources in an area, but also surface topography, the size of the topological "air basin," and the prevailing meteorological conditions.

The CAA directed the USEPA to develop, implement, and enforce strong environmental regulations that would ensure clean and healthy ambient air quality. To protect public health and welfare, USEPA developed numerical concentration-based standards, or National Ambient Air Quality Standards (NAAQS), for pollutants that have been determined to impact human health and the environment. USEPA established both primary and secondary NAAQS under the provisions of the CAA. NAAQS are currently established for six criteria air pollutants: ozone (O_3), carbon monoxide (CO), nitrogen dioxide (NO_2), sulfur dioxide (SO_2), respirable particulate matter (including particulate matter equal to or less than 10 microns in diameter [PM_{10}] and particulate matter equal to or less than 2.5 microns in diameter [$PM_{2.5}$]), and lead (Pb). The primary NAAQS represent maximum levels of background air pollution that are considered safe, with an adequate margin of safety to protect public health. Secondary NAAQS represent the maximum pollutant concentration necessary to protect vegetation, crops, and other public resources along with maintaining visibility standards. **Table 3-2** presents the primary and secondary USEPA NAAQS (USEPA 2007).

The CAA and USEPA delegated responsibility for ensuring compliance with NAAQS to the states and local agencies. As such, each state must develop air pollutant control programs and promulgate regulations and rules that focus on meeting NAAQS and maintaining healthy ambient air quality levels. These programs are detailed in State Implementation Plans (SIPs), which are required to be developed by each state or local regulatory agency and approved by USEPA. A SIP is a compilation of regulations, strategies, schedules, and enforcement actions designed to move the state into compliance with all NAAQS. Any changes to the compliance schedule or plan (e.g., new regulations, emissions budgets, controls) must be incorporated into the SIP and approved by USEPA. USEPA has delegated the authority for ensuring compliance with the NAAQS to the Washington Department of Ecology (WADOE). Therefore, the Proposed Action is subject to rules and regulations developed by this regulatory body.

Table 3-2. National Ambient Air Quality Standards

Pollutant	Standard Value		Standard Type
CO			
8-hour Average [a]	9 ppm	(10 mg/m^3)	Primary and Secondary
1-hour Average [a]	35 ppm	(40 mg/m^3)	Primary
NO_2			
Annual Arithmetic Mean	0.053 ppm	(100 µg/m^3)	Primary and Secondary
O_3			
8-hour Average [b]	0.08 ppm	(157 µg/m^3)	Primary and Secondary
1-hour Average [c]	0.12 ppm	(240 µg/m^3)	Primary and Secondary
Pb			
Quarterly Average	--	1.5 µg/m^3	Primary and Secondary
PM_{10}			
Annual Arithmetic Mean [d]	--	50 µg/m^3	Primary and Secondary
24-hour Average [a]	--	150 µg/m^3	Primary and Secondary
$PM_{2.5}$			
Annual Arithmetic Mean [e]	--	15 µg/m^3	Primary and Secondary
24-hour Average [f]	--	35 µg/m^3	Primary and Secondary
SO_2			
Annual Arithmetic Mean	0.03 ppm	(80 µg/m^3)	Primary
24-hour Average [a]	0.14 ppm	(365 µg/m^3)	Primary
3-hour Average [a]	0.5 ppm	(1,300 µg/m^3)	Secondary

Source: USEPA 2007

Notes: Parenthetical values are approximate equivalent concentrations.

[a] Not to be exceeded more than once per year.

[b] To attain this standard, the 3-year average of the fourth-highest daily maximum 8-hour average ozone concentrations measured at each monitor within an area over each year must not exceed 0.08 ppm.

[c] (a) The standard is attained when the expected number of days per calendar year with maximum hourly average concentrations above 0.12 ppm is ≤ 1. (b) As of June 15, 2005, USEPA revoked the 1-hour ozone standard in all areas except the 14 8-hour ozone nonattainment Early Action Compact Areas.

[d] To attain this standard, the expected annual arithmetic mean PM_{10} concentration at each monitor within an area must not exceed 50 µg/m^3.

[e] To attain this standard, the 3-year average of the annual arithmetic mean $PM_{2.5}$ concentrations from single or multiple community-oriented monitors must not exceed 15.0 µg/m^3.

[f] To attain this standard, the 3-year average of the 98th percentile of 24-hour concentrations at each population-oriented monitor within an area must not exceed 35 µg/m^3 (*Federal Register* Vol. 71, No. 200, p61144, October 17, 2006).

USEPA classifies the air quality in an air quality control region (AQCR), or in subareas of an AQCR, according to whether the concentrations of criteria pollutants in ambient air exceed the primary or secondary NAAQS. All areas within each AQCR are therefore designated as either "attainment," "nonattainment," "maintenance," or "unclassified" for each of the six criteria pollutants. Attainment

means that the air quality within an AQCR is better than the NAAQS, nonattainment indicates that criteria pollutant levels exceed NAAQS, maintenance indicates that an area was previously designated nonattainment but is now attainment, and unclassified means that there is not enough information to appropriately classify an AQCR, so the area is considered attainment.

The General Conformity Rule requires that any Federal action meet the requirements of a SIP or Federal Implementation Plan. More specifically, CAA conformity is ensured when a Federal action does not cause a new violation of the NAAQS; contribute to an increase in the frequency or severity of violations of NAAQS; or delay the timely attainment of any NAAQS, interim progress milestones, or other milestones toward achieving compliance with the NAAQS.

The General Conformity Rule applies only to actions in nonattainment or maintenance areas and considers both direct and indirect emissions. The rule applies only to Federal actions that are considered "regionally significant" or where the total emissions from the action meet or exceed the *de minimis* thresholds presented in 40 CFR 93.153. An action is regionally significant when the total nonattainment pollutant emissions exceed 10 percent of the AQCR's total emissions inventory for that nonattainment pollutant. If a Federal action does not meet or exceed the *de minimis* thresholds and is not considered regionally significant, then a full Conformity Determination is not required.

Title V of the CAA Amendments (CAAA) of 1990 requires states and local agencies to permit major stationary sources. A major stationary source is a facility (i.e., plant, base, or activity) that can emit more than 100 tons per year (tpy) of any one criteria air pollutant, 10 tpy of a hazardous air pollutant, or 25 tpy of any combination of hazardous air pollutants. However, lower pollutant-specific "major source" permitting thresholds apply in nonattainment areas. For example, the Title V permitting threshold for an "extreme" O_3 nonattainment area is 10 tpy of potential volatile organic compound (VOC) or nitrogen oxide (NO_x) emissions. The purpose of the permitting rule is to establish regulatory control over large, industrial-type activities and monitor their impact on air quality.

Federal Prevention of Significant Deterioration (PSD) regulations also define air pollutant emissions from proposed major stationary sources or modifications to be "significant" if (1) a proposed project is within 10 kilometers of any Class I area, and (2) regulated pollutant emissions would cause an increase in the 24-hour average concentration of any regulated pollutant in the Class I area of 1 $\mu g/m^3$ or more (40 CFR 52.21(b)(23)(iii)). A Class I area includes national parks larger than 6,000 acres, national wilderness areas and national memorial parks larger than 5,000 acres, and international parks. PSD regulations also define ambient air increments, limiting the allowable increases to any area's baseline air contaminant concentrations, based on the area's class designation [40 CFR 52.21(c)].

3.3.2 Existing Conditions

McChord AFB is located within Pierce County, Washington. Pierce County is within the Puget Sound Intrastate Air Quality Control Region (PSIAQCR). The PSIAQCR consists of the counties of King, Kitsap, Pierce, and Snohomish, Washington. The PSIAQCR, including McChord AFB, is classified as being in a moderate maintenance area for CO and is classified as being in attainment with all other criteria pollutants (USEPA 2004).

The WADOE administers the state's pollution program under authority of Chapter 43.21A, Department of Ecology, Revised Code of Washington. The WADOE is responsible for implementation of the CAA and has adopted the Federal primary and secondary NAAQS. WADOE has developed a USEPA-approved SIP. The state of Washington has established seven separate local air pollution control agencies responsible for enforcing Federal, state, and local air pollution standards, laws, and regulations within the state. The local air pollution control agency responsible for air quality within the PSIAQCR is the Puget

Sound Clean Air Agency (PSCAA). The PSCAA works with McChord AFB in monitoring and implementing the installation's stationary source permits and emissions inventory. As required by PSCAA permitting requirements, McChord AFB routinely calculates annual criteria pollutant emissions from stationary emissions sources and provides this information to the state on a yearly basis. However, there is no routine requirement to calculate pollutant emissions calculations for aircraft operations, government-owned vehicles (GOVs) and privately owned vehicles (POVs), aircraft engine testing, aerospace ground equipment (AGE), and other sources not included in the state's stationary source permitting program. The purpose of this annual emissions inventory is to estimate and document air pollutant emissions from stationary sources. Stationary source categories include external combustion sources, internal combustion sources, fuel transfer/dispensing, storage tanks, surface coating operations, degreasers/solvent cleaners, aircraft fuel cell maintenance, off-aircraft engine testing, miscellaneous chemical usage, and dust collectors.

McChord AFB is classified as a major source. However, the base has been issued a Synthetic Minor Emissions Permit from the PSCAA. There are various stationary combustion sources on installation that have the potential to emit (PTE), including the installation's boilers and generators. VOCs are emitted primarily from handling of organic liquids (i.e., refueling activities). Miscellaneous particulate matter sources at McChord AFB include abrasive blasting units and woodworking equipment (MAFB 2005a). Other stationary sources at McChord AFB include paint booths, a wash rack, and a small arms range.

The McChord AFB annual emissions for Calendar Year (CY) 2004 from stationary and area sources are shown in **Table 3-3**. Emissions from mobile sources are not tracked on McChord AFB.

Mount Rainer National Park, which is less than 50 miles to the east of McChord AFB, is a highly sensitive Class I airshed. However, since McChord AFB is not within 10 kilometers of a Class I area, PSD regulations do not apply and are not discussed further in this EA.

Table 3-3. Annual Stationary and Area Source Emissions for McChord AFB

Year	NO_x	VOC	SO_x	CO	PM_{10}
Potential Emissions (2004)	555.16	81.73	80.41	201.64	50.03
Actual Emissions (2004)	50.61	13.57	0.74	17.74	1.96

Source: MAFB 2005a

3.4 Safety

3.4.1 Definition of the Resource

A safe environment is one in which there is no, or an optimally reduced, potential for death, serious bodily injury or illness, or property damage. Human health and safety addresses both workers' health and public safety during demolition activities and facilities construction, and during subsequent operations of those facilities.

Construction site safety is largely a matter of adherence to regulatory requirements imposed for the benefit of employees and implementation of operational practices that reduce risks of illness, injury, death, and property damage. The health and safety of onsite military and civilian workers are safeguarded by numerous DOD and USAF regulations designed to comply with standards issued by the Occupational Safety and Health Administration (OSHA) and USEPA. These standards specify the amount and type of

training required for industrial workers, the use of protective equipment and clothing, engineering controls, and maximum exposure limits for workplace stressors.

Safety and accident hazards can often be identified and reduced or eliminated. Necessary elements for an accident-prone situation or environment include the presence of the hazard itself together with the exposed (and possibly susceptible) population. The degree of exposure depends primarily on the proximity of the hazard to the population. Activities that can be hazardous include transportation, maintenance and repair activities, and the creation of extremely noisy environments. The proper operation, maintenance, and repair of vehicles and equipment carry important safety implications. Any facility or human-use area with potential explosive or other rapid oxidation process creates unsafe environments for nearby populations. Extremely noisy environments can also mask verbal or mechanical warning signals such as sirens, bells, or horns.

3.4.2 Existing Conditions

Construction Site Safety. All contractors performing construction activities are responsible for following ground safety and OSHA regulations and are required to conduct construction activities in a manner that does not pose any risk to workers or personnel. Industrial hygiene programs address exposure to hazardous materials, use of personal protective equipment, and use and availability of Material Safety Data Sheets. Industrial hygiene is the responsibility of contractors, as applicable. Contractor responsibilities are to review potentially hazardous workplaces; to monitor exposure to workplace chemical (e.g., asbestos, lead, hazardous material), physical (e.g., noise propagation), and biological (e.g., infectious waste) agents; to recommend and evaluate controls (e.g., ventilation, respirators) to ensure personnel are properly protected or unexposed; and to ensure a medical surveillance program is in place to perform occupational health physicals for those workers subject to any accidental chemical exposures or engaged in hazardous waste work.

Munitions and Other Safety Criteria. There are several areas that are constrained by QD clear zones at McChord AFB (refer to **Figure 2-2**). There are two weapons storage areas (WSAs) on base, one west of the railroad tracks and another on the southern edge of the base. Both WSA's have 1,250-foot QD clear zones that limit development in their areas. There are three hot cargo pads on the eastern side of the airfield. These pads provide space for loading and unloading of cargo aircraft that are transporting munitions and have 1,250-foot QD clear zones associated with them. A 1,250-foot QD clear zone is associated with the fighter aircraft parking area on E-Ramp. A less restrictive QD of 500 feet is associated with the EOD pit on the east side of the base (62 AW 2005a). Although most projects would not be within range sites, munitions and unexploded ordnance (UXO) could still be encountered within some project areas.

3.5 Geological Resources

3.5.1 Definition of the Resource

Geological resources consist of the Earth's surface and subsurface materials. Within a given physiographic province, these resources typically are described in terms of topography, geology, soils, and, where applicable, geologic hazards and paleontology.

Topography is defined as the relative positions and elevations of the natural or human-made features of an area that characterize the configuration of its surface. An area's topography is influenced by many factors, including human activity, seismic activity of the underlying geological material, climatic conditions, and erosion. Information about an area's topography typically encompasses surface elevations, slope, and physiographic features (i.e., mountains, ravines, or depressions).

Geology typically consists of surface and subsurface materials and their inherent properties. Principal factors influencing the ability of geological resources to support structural development are depth, composition, and stability of underlying bedrock or sediments; seismic properties (i.e., potential for subsurface shifting, faulting, or crustal disturbance); topography; and soil stability.

Soils are the unconsolidated materials overlying bedrock or other parent material. Soils typically are described in terms of their complex type, slope, and physical characteristics. Differences among soil types in terms of their structure, elasticity, strength, shrink-swell potential, and erosion potential affect their abilities to support certain applications or uses. In appropriate cases, soil properties must be examined for their compatibility with particular construction activities or types of land use.

Prime farmland is protected under the Farmland Protection Policy Act of 1981 (7 U.S.C. 4201–4209). Prime farmland is defined as land that has the best combination of physical and chemical characteristics for producing food, feed, forage, fiber, and oilseed crops, and is also available for these uses. The soil qualities, growing season, and moisture supply are those needed for a well-managed soil to produce a sustained high yield of crops in an economic manner. The land could be cropland, pasture, rangeland, or other land, but not urban built-up land or water. The intent of the Farmland Protection Policy Act is to minimize the extent that Federal programs contribute to the unnecessary conversion of farmland to nonagricultural uses. The Farmland Protection Policy Act also ensures that Federal programs are administered in a manner that, to the extent practicable, is compatible with private, state, and local government programs and policies to protect farmland. The Natural Resources Conservation Service (NRCS) is responsible for overseeing compliance with the Farmland Protection Policy Act and has developed the rules and regulations for implementation of the act (7 CFR Part 658).

3.5.2 Existing Conditions

Topography. McChord AFB is in the southern part of the Puget Sound Basin (62 CES/CEV 2003a). The elevation at McChord AFB is generally between 280 feet and 320 feet above mean sea level (MSL), but ranges from 263 feet above MSL (glacial kettles) to 360 feet above MSL (Wescott and Porter Hills) (62 CES/CEV 2005).

Geology. The surficial geology is primarily a result of the Vashon glaciation, which ended about 12,000 years ago. This event produced an ice sheet over central Pierce County estimated to have been nearly 1,500 feet thick (62 CES/CEV 2005). The uppermost several hundred feet of subsurface deposits are composed of material deposited during this glacial event. Glacial deposits consist of surface alluvium (sediments deposited by running water), outwash gravel (deposited by meltwater), cemented glacial till (nonstratified glacial deposits that were in direct contact with ice), and two underlying sand units separated by an impermeable blue clay lens (62 AW 2005a).

Soils. The primary soil mapping unit on McChord AFB is the Spanaway association. A soil association consists of one or more dominant soil series and some minor soils. The primary soil series that is mapped on McChord AFB is the Spanaway gravely sandy loam. The soils that are mapped on McChord AFB and their general characteristics are presented in **Table 3-4**. The soils on McChord AFB are generally highly pervious, which is a limiting factor for natural vegetation and landscape plantings. The upper horizons of the soils become very dry during the summer months due to limited rainfall, and as a result planted areas require irrigation. McChord AFB is primarily a prairie ecosystem because of the low moisture content of the soils combined with natural fires (62 AW 2005a).

There are no prime or unique farmlands at McChord AFB (62 CES/CEV 2003a). Dupont muck can be a prime farmland soil if it is drained and Everett gravelly sandy loam and Spanaway gravelly sandy loam can be prime farmland soils if they are irrigated. However, these soils are not drained or irrigated at McChord AFB.

Table 3-4. Soil Characteristic at McChord AFB

Map Unit Name [a]	General Soil Characteristics	Hydric [b]	Farmland Classification [c]
Spanaway gravelly sandy loam	– Deep – Somewhat excessively drained – Slow runoff – Moderately rapid permeability – No ponding – No flooding – Water table is greater than 72 inches – Low shrink-swell potential	No	Prime farmland if irrigated
Everrett gravelly sandy loam	– Very deep – Somewhat excessively drained – High to very high saturated hydraulic conductivity – No ponding – No flooding – Water table is greater than 72 inches – Low shrink-swell potential	No	Prime farmland if irrigated
Dupont muck	– Very deep – Very poorly drained – Surface runoff ponded – Moderately slow permeability – Frequently flooded – Seasonal water table of 6 inches – Low shrink-swell potential	Yes	Prime farmland if drained and either protected from flooding or not frequently flooded during the growing season
Filled area (clean fill)	– Intensely modified soil	No	No
Landfill (debris)	– Intensely modified soil	No	No
Borrow area	– Intensely modified soil	No	No

Sources: 62 CES/CEV 2003a, NRCS 2006, NRCS undated

3.6 Water Resources

3.6.1 Definition of the Resource

Water resources include groundwater, surface water, and floodplains. Evaluation of water resources examines the quantity and quality of the resource and its demand for various purposes.

Groundwater consists of subsurface hydrologic resources. It is an essential resource often used for potable water consumption, agricultural irrigation, and industrial applications. Groundwater typically can be described in terms of its depth from the surface, aquifer or well capacity, water quality, surrounding geologic composition, and recharge rate.

Surface water resources consist of lakes, rivers, and streams. Surface water is important for its contributions to the economic, ecological, recreational, and human health of a community or locale.

Storm water is an important component of surface water systems because of its potential to introduce sediments and other contaminants that could degrade lakes, rivers, and streams. Storm water flows, which can be exacerbated by high proportions of impervious surfaces associated with buildings, roads, and parking lots, are important to the management of surface water. Storm water systems convey storm water runoff away from developed sites to appropriate receiving surface waters. Various systems and devices might be used to slow the movement of water. For instance, a large, sudden flow could scour a streambed and harm biological resources. Storm water systems provide the benefit of reducing sediments and other contaminants that would otherwise flow directly into surface waters. Failure to size storm water systems appropriately to hold or delay conveyance of the largest predicted precipitation event often leads to downstream flooding and the environmental and economic damages associated with flooding. Higher densities of development, such as those found in urban areas, require greater degrees of storm water management because of the higher proportions of impervious surfaces that occur in urban areas.

The Clean Water Act (CWA) (33 U.S.C. 1251 et. seq., as amended) establishes Federal limits, through the National Pollutant Discharge Elimination System (NPDES), on the amounts of specific pollutants that are discharged to surface waters to restore and maintain the chemical, physical, and biological integrity of the water. A NPDES permit would be required for any change in the quality or quantity of wastewater discharge or storm water runoff from construction sites where 1 acre or more would be disturbed. Section 404 of the CWA regulates the discharge of fill material into waters of the United States.

Floodplains are areas of low-level ground present along rivers, stream channels, or coastal waters. Such lands might be subject to periodic or infrequent inundation due to rain or melting snow. Risk of flooding typically hinges on local topography, the frequency of precipitation events, and the size of the watershed above the floodplain. Flood potential is evaluated by the Federal Emergency Management Agency (FEMA), which defines the 100-year floodplain. The 100-year floodplain is the area that has a 1 percent chance of inundation by a flood event in a given year. Certain facilities inherently pose too great a risk from flooding to be located in either the 100- or 500-year floodplain, such as hospitals, schools, or storage buildings for irreplaceable records. Federal, state, and local regulations often limit floodplain development to passive uses, such as recreational and preservation activities, to reduce the risks to human health and safety.

EO 11988, *Floodplain Management*, requires Federal agencies to determine whether a proposed action would occur within a floodplain. This determination typically involves consultation of appropriate FEMA Flood Insurance Rate Maps, which contain enough general information to determine the relationship of the project area to nearby floodplains. EO 11988 directs Federal agencies to avoid floodplains unless the agency determines that there is no practicable alternative. Where the only practicable alternative is to site in a floodplain, a specific step-by-step process must be followed to comply with EO 11988. The process is outlined in the FEMA document *Further Advice on EO 11988 Floodplain Management*. As a planning tool, the NEPA process incorporates floodplain management through analysis and through coordination with applicable regulatory agencies that will review this EA.

3.6.2 Existing Conditions

Surface Water. The surface waters at the installation consist of nearly 7 acres of ponds and 2 miles of streams. The highly permeable nature of the surface soil allows rapid infiltration of precipitation with little or no surface flow and only occasional, short-term accumulation of water in ponds or wetlands. There are two streams and numerous small ponds and wetlands on the installation.

Clover Creek is the dominant surface water feature, which enters the installation on the eastern boundary. Morey Creek enters McChord AFB just south of Clover Creek. Morey Creek flows into Morey Pond, a small 3.5-acre impoundment, and joins Clover Creek just east of the primary runway. Clover Creek passes through a 0.6-mile culvert underneath the airfield pavements, and then flows through industrial areas before exiting near the 1100-area dormitories. Clover Creek flows for approximately 2 miles after exiting the installation into Lake Steilacoom, which ultimately drains into Puget Sound via Chambers Creek (62 AW 2005a).

There are numerous "kettle hole" wetlands on McChord AFB, which are discussed in more detail in **Section 3.7.2**. These small bodies of water are influenced by groundwater. Carter Lake, which is 2.5 acres, is on the western portion of the installation in the MFH area. Carter Lake is the result of storm water surface drainage (62 CES/CEV 2003a).

Groundwater. Two near-surface aquifers, the Vashon Drift/Post-Kitsap (commonly called the Vashon Aquifer) and the Salmon Springs Aquifer, occur under McChord AFB and are used for water supply systems for the installation (see **Section 3.10.2** for more information on the potable water system). The Kitsap Aquitard, which occurs beneath most of the installation, separates these aquifers and prevents flow between them (62 CES/CEV 2003a).

Groundwater depth beneath most of McChord AFB is between 10 and 40 feet. Seasonal water table fluctuations range from 2 to 10 feet below ground surface. The highest levels occur in early spring. The lowest levels generally occur in late summer/early fall (62 CES/CEV 2003a). Most groundwater flow beneath McChord AFB is to the northwest. Recharge directly from precipitation and infiltration (Spanaway Lake is east of McChord AFB) is both important for maintaining groundwater levels. The rate of groundwater movement in the deep Salmon Springs aquifer has been estimated at 2 to 5 feet per day, while the rate of movement in the overlying shallow Vashon aquifer is approximately 0.3 to 5 feet per day (62 AW 2005a). McChord AFB is also located over part of the recharge area for the Colvos Sand aquifer, which is easily contaminated because of the high permeability of the overlying geological layers.

Groundwater quality from the wells on McChord AFB is generally good. Groundwater protection from the ongoing operations and accidental spills at McChord AFB is critical because of the high permeability of the sand and gravel formations beneath the surface (62 AW 2005a). Wellhead protection is required by Washington Administrative Code (WAC) Section 246-290 for all Group A public water systems (serving 25 or more people). McChord AFB's *Wellhead Protection Plan* is part of the *Comprehensive Drinking Water System Plan* (62 AW 2005b). The purpose of the program is to protect sources of drinking water from contamination. Potential groundwater contaminant sources at McChord AFB include the Area D/American Lake Garden Tract, Washrack Treatment Area, and Washington State Department of Ecology Consent Decree sites (62 AW 2005a, 62 AW 2005b).

Floodplains. The U.S. Army Corps of Engineers (USACE) completed a Clover Creek floodplain study on McChord AFB in 2000 (USACE 2000). The study found that the installation has 102 acres within a 100-year floodplain, and 182 acres within a 500-year floodplain. Airfield, grasslands, and a narrow riparian area occur in the 100-year floodplain (62 CES/CEV 2003a). As a result of the floodplain survey, new construction on the installation should build the lowest floor levels at or above the 100-year flood level for noncritical facilities, and at or above the 500-year flood level for critical facilities, in order to comply with the National Flood Insurance Program and EO 11988 (62 AW 2005a). Critical facilities include emergency facilities, the airfield operations towers, and hazardous materials or waste storage facilities. The 100-year floodplain is shown on **Figure 2-2**.

3.7 Biological Resources

3.7.1 Definition of the Resource

Biological resources include wildlife (fauna), vegetation (flora), and the ecosystems in which these resources exist. Specific concerns relating to biological resources consist of declines in species diversity, impacts on threatened and endangered species, and degradation of wetlands and riparian zones.

Vegetation and Wildlife. Biological resources include native or naturalized plants and animals, and the habitats, such as wetlands, forests, and grasslands, in which they exist.

Protected and Sensitive Species. Sensitive and protected biological resources include federally listed (threatened or endangered), proposed, and candidate species, and designated or proposed critical habitat; species of concern managed under Conservation Agreements or Management Plans; and state-listed species.

The ESA (16 U.S.C. 1531 et seq.) specifically charges Federal agencies with the responsibility of using their authority to conserve threatened and endangered species. All Federal agencies must ensure an action they authorize, fund, or carry out is not likely to jeopardize the continued existence of a threatened or endangered species or result in the destruction of critical habitat for these species, unless the agency has been granted an exception. The Secretary of the Interior, using the best available scientific data, determines which species are officially threatened or endangered.

The Migratory Bird Treaty Act makes it unlawful to pursue, hunt, take, capture, or kill; attempt to take, capture or kill; possess, offer to or sell, barter, purchase, deliver, or cause to be shipped, exported, imported, transported, carried, or received any migratory bird, part, nest, egg, or product, manufactured or not.

Wetlands. Wetlands are important natural systems and habitats because of the diverse biologic and hydrologic functions they perform. These functions include water quality improvement, groundwater recharge and discharge, pollution mitigation, nutrient cycling, wildlife habitat, and erosion protection. Wetlands are protected as a subset of the "waters of the United States" under Section 404 of the CWA. The term "waters of the United States" has a broad meaning under the CWA and incorporates deepwater aquatic habitats and special aquatic habitats (including wetlands). The USACE defines wetlands as "those areas that are inundated or saturated with ground or surface water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted to life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas" (33 CFR Part 328).

The USACE is responsible for making jurisdictional determinations and regulating wetlands under Section 404 of the CWA. Aspects of this authority have been delegated to WADOE. WADOE regulates wetlands under the Hydraulic Code, State Water Pollution Control Act, Shoreline Management Act, and the Forest Practices Act. Local governments at the county or city level regulate wetlands under the Growth Management Act and the Shoreline Management Act.

Applicants receiving a Section 404 permit from the USACE are required to obtain a Section 401 water quality certification from the WADOE. The nationwide permits also need 401 Certification from WADOE. WADOE has already approved, denied or partially denied specific nationwide permits. If approved, no further 401 Certification review by WADOE is required. If partially denied without prejudice, an individual certification or Letter of Verification from WADOE is required. If denied without prejudice, an individual certification is required for all activities under that nationwide permit.

The USACE also makes jurisdictional determinations under Section 10 of the Rivers and Harbors Act of 1899. NRCS has developed procedures for identifying wetlands for compliance with the Food Security Act of 1985, and the National Wetlands Inventory has developed a classification system for identifying wetlands. Through the National Wetlands Inventory, the USFWS is the principal Federal agency that provides information to the public on the extent and status of wetlands.

EO 11990, *Protection of Wetlands*, requires that Federal agencies provide leadership and take actions to minimize or avoid the destruction, loss, or degradation of wetlands and to preserve and enhance the natural and beneficial values of wetlands. Federal agencies are to avoid new construction in wetlands, unless the agency finds there is no practicable alternative to construction in the wetland, and the proposed construction incorporates all possible measures to limit harm to the wetland.

3.7.2 Existing Conditions

Vegetation. Ecoregions are defined as areas with broad ecological patterns in vegetation, soils, geology, hydrology, landforms, and natural disturbance. The Puget Trough ecoregion includes Puget Sound and the forested foothills and rivers adjacent to it. It runs the length of Washington between the Cascade Mountains on the east and the Olympic Mountains and Willapa Hills on the west. The Washington Department of Fish and Wildlife considers the glacial outwash mosaic of Puget Trough ecoregion, including prairie, kettle hole wetlands, white (Garry) oak (*Quercus garryana*) woodlands, and lowland coniferous forests, to be of state significance (62 AW 2005a). Although McChord AFB has been significantly altered, some areas still contain these native ecosystems (TNC 1999). Historically, vegetation in the McChord AFB vicinity consists of a combination of drought-tolerant prairie grasslands, oak woods, and ponderosa pine (*Pinus ponderosa*) forests with some emergent marsh and forested wetlands. Idaho fescue (*Festuca idahoensis*) grasslands and Garry oak stands colonized the area after the retreat of the Vashon glaciation (62 CES/CEV 2003a).

The composition of the vegetation at the installation has been changing since the 1800s as a result of fire suppression, grazing, and the introduction of nonnative species. Fire-susceptible plants, including Douglas fir (*Psuedotsuga menziesii*) and exotic species such as Scot's broom (*Cytisus scoparius*), began to dominate the vegetation on the base. McChord AFB has a cooperative agreement with The Nature Conservancy (TNC) that includes mechanical mowing of Scot's broom, an invasive shrub and Class B noxious weed, in an attempt to control its spread and reestablish native habitat (62 CES/CEV 2003a).

The native forested areas on McChord AFB—Garry oak and ponderosa pine habitats—have been reduced through urbanization and development. Remnant stands of ponderosa pine savannahs and oak woodlands still exist on McChord AFB. TNC found 105 Garry oak stands (covering 365 acres) and a single 7-acre ponderosa pine stand on the installation. The largest contiguous area of Garry Oak vegetation covers 144 acres in the South Approach Zone. Smaller stands occur primarily in the main installation area. The oak stands range from mature closed canopy oak woodlands (at the Skeet Range wetland) to open young oak woodlands (at Morey Pond and Bensten wetland). Oaks in the South Approach Zone, 300 Area, and near the Skeet Range provide potential habitat for the state-threatened Western gray squirrel (*Sciurus griseus griseus*) (62 AW 2005a).

The South Approach Zone is a 695-acre area south of Perimeter Road between the south end of the airfield and Fort Lewis. The natural landscape for the South Approach Zone is predominantly prairie and oak woodlands. This area contains some of the most ecologically diverse habitat on McChord AFB and is contiguous with similar habitat on Fort Lewis. Fort Lewis and McChord AFB, combined, contain the largest remaining block of natural landscape in the Puget Trough ecoregion (62 AW 2005a). No projects associated with the Proposed Action would occur in the South Approach Zone.

Wildlife. The natural setting of McChord AFB provides habitat for more than 131 bird, 19 mammal, 12 fish, 6 amphibian, 4 reptile, 16 butterfly, and 45 moth species (62 AW 2005a). There are approximately 1,325 acres, including fragmented areas, available for fish and wildlife habitat at the installation. Habitat management is the basis for McChord AFB's fish and wildlife management program. The goal of the program is the protection, conservation, and management of the fish and wildlife resources as vital elements of the McChord AFB natural resources program with particular attention to threatened and endangered species and other species of concern (62 AW 2005a).

Several species and habitat inventories and surveys were completed for McChord AFB under contract with TNC to determine the locality and significance of sensitive species and habitats. These surveys and inventories included (1) species of concern, (2) amphibians and reptiles, (3) wetlands and sensitive habitats, (4) neotropical migratory birds, and (5) moths and butterflies (TNC 1999).

McChord AFB is also within the generalized western migratory route for neotropical migratory birds. More than half of all bird species nesting in the United States are classified as neotropical migratory birds. This group includes many waterfowl, birds of prey, shorebirds, and songbirds. Approximately 57 percent of the bird species identified on McChord AFB are neotropical migrant land birds (MAFB 2003).

As part of the fish and wildlife management program at McChord AFB, natural communities on the installation, especially in the South Approach Zone, should be protected to the maximum extent possible within the constraints of the McChord AFB mission. However, the installation is challenged with maintaining the South Approach Zone as a natural area and utilizing it for flightline operations. Natural resource areas on the installation include Carter Lake and five designated Watchable Wildlife Areas. These include the following:

- *Mountain View* is a 10-acre area that consists of decadent Douglas fir in a former Garry oak-grass prairie site. Douglas-fir snags provide good wildlife habitat. The only known nesting site for red-tailed hawk (*Buteo jamaicensis*) on McChord AFB was found here.
- *Porter Hills* contains a 145-acre natural area with varied terrain and forest types. Vegetation of interest includes a western red cedar (*Thuja plicata*) swamp, large shore pine (*Pinus contorta*), and Pacific yew (*Taxus brevifolia*). Featured species include Columbian black-tailed deer (*Odocoileus hemionus columbianus*). This area contains 5.25 miles of 3- to 4-foot-wide foot trails.
- *Wescott Hills* is a 100-acre natural forested area across Lincoln Boulevard from the golf course. Columbian black-tailed deer are found in this area.
- *Morey Pond*, including a short portion of Morey Creek, is a 3.5-acre fishing and picnic area. Featured wildlife species found here include Canada goose (*Branta canadensis*), mallard (*Anas platyrhynchos*), cinnamon teal (*Anas cyanoptera*), wood duck (*Aix sponsa*), various swallows, raptors, great blue heron (*Ardea herodias*), largemouth bass (*Micropterus salmoides*), and painted turtle (*Chrysemys picta*).
- *Gasking Park*, a former 10-acre park area, consists of a marsh surrounded by an old Garry oak grassland. Featured species are mallard and coyote (*Canis latrans*).

No projects associated with the Proposed Action would occur in the Watchable Wildlife Areas.

Protected and Sensitive Species. An installation's overall ecosystem management strategy must provide for protection and recovery of federally threatened and endangered species. As a policy, the USAF gives the same protection, when practical, to any state-listed threatened, endangered, or other rare species. Twenty-six protected or sensitive species have the potential to occur on McChord AFB: 11 bird, one

amphibian, one reptile, five mammal, four insect (butterfly), and four plant species (62 CES/CEVN 2002). Sensitive species and their Federal and state status are presented in **Table 3-5**. The wetlands, oak, and coniferous communities found on McChord AFB represent significant examples of the declining ecosystems once native to the Puget Sound region that provide habitat for many plant and wildlife species of concern. The size of the high quality wetland and oak habitats in the South Approach Zone provides unique protection opportunity in the South Puget Sound region for several species of concern, including the federally threatened water howellia (*Howellia aquatilis*) (TNC and WSDNR 1996).

Table 3-5. Federally and State-Listed Threatened, Endangered, and Rare Species that have the Potential to Occur on McChord AFB

Common Name	Scientific Name	State Status	Federal Status
Birds			
Bald eagle *	*Haliaeetus leucocephalus*	T	N
Peregrine falcon	*Falco peregrinus*	S	SC
Olive-sided flycatcher	*Contopus borealis*	N	SC
Loggerhead shrike	*Lanius ludovicianus*	C	N
Merlin	*Falco columarius*	C	N
Northern goshawk	*Accipiter genitilis*	C	SC
Oregon vesper sparrow	*Pooecetes gramineus affinis*	C	SC
Pileated woodpecker	*Dryocopus pileatus*	C	N
Purple martin	*Progne subis*	C	N
Streaked horned lark	*Eremophila alpestris strigata*	C	C
Vaux's swift	*Chaetura vauxi*	C	N
Reptiles			
Western pond turtle	*Clemmys marmorata*	E	SC
Amphibians			
Western toad	*Bufo boreas*	C	SC
Mammals			
Western gray squirrel	*Sciurus griseus griseus*	T	SC
Western (Mazama) pocket gopher	*Thomomys mazama*	C	C
Pacific Townsend big-eared bat	*Corynorhinus townsendii*	C	SC
Long-eared myotis (bat)	*Myotis evotis*	M	SC
Long-legged myotis (bat)	*Myotis volans*	M	SC

Table 3-5. Federally and State-Listed Threatened, Endangered, and Rare Species that have the Potential to Occur on McChord AFB (continued)

Common Name	Scientific Name	State Status	Federal Status
Insects			
Puget blue	*Plebejus icarioides blackmorei*	C	N
Valley (Zerene) silverspot	*Speyeria zerene bremnerii*	C	SC
Mardon skipper	*Polites mardon*	E	C
Whulge checkerspot	*Euphydryas editha taylori*	C	C
Plants			
White-top aster	*Aster curtus*	S	SC
Water howellia	*Howellia aquatilis*	E	T
Torrey's peavine	*Lathyrus torreyi*	T	SC
Golden paintbrush	*Castilleja levisecta*	E	T

Source: 62 CES/CEV 2003a, 62 CES/CEVN 2002

Notes:

* 50 CFR Part 17 provided for the Federal delisting of the bald eagle, effective August 8, 2007.
E Federal- or state-listed endangered species
T Federal- or state-listed threatened species
C Federal or state candidate species
SC Federal species of concern
S State sensitive species
M Monitored species
N Not listed

Of the 26 sensitive or protected species that have the potential to occur at McChord AFB, seven are federally listed or state-listed as threatened or endangered. These are described in more detail below.

Single bald eagles (*Haliaeetus leucocephalus)* (state-listed as threatened) are occasionally seen flying over McChord AFB and are rarely seen eating. A single immature bird was observed eating a fish in the lower tree canopy near Porter Hills in June 1995. Active bald eagle nests are known from Spanaway Lake (approximately 1 mile east of McChord AFB) and American Lake (approximately 1 mile west of McChord AFB). Suitable nesting habitat is not found on the installation and prey is limited (TNC and WSDNR 1996).

While potential habitat for western pond turtles (*Clemmys marmorata*) (state-listed as endangered) occurs at McChord AFB (especially at Clover Creek, Morey Pond, Talbot wetland, and 166th Street wetland), none were observed in the 1994 and 1995 surveys (TNC and WSDNR 1996).

Western gray squirrels (state-listed as threatened) were observed at six locations on McChord AFB in 1993, 1994, and 1995. The oak stands within the South Approach Zone represent the best habitat for western gray squirrels. These stands are found within a mosaic of habitat types including wetlands and coniferous forests (TNC and WSDNR 1996).

Mardon skippers (*Polites mardon*) (state-listed as endangered) were not observed in the 1995 butterfly survey, which might have underestimated butterfly species richness at McChord AFB. Only remnants of

native shortgrass prairie habitat remain at McChord AFB. The noxious weed Scot's broom dominates this habitat at the installation, making it unsuitable for butterfly species.

Water howellia (federally listed as threatened and state-listed as endangered) occurs in the emergent zone of the lower Bensten wetland in the South Approach Zone. Torrey's peavine (*Lathyrus torreyi*) (state-listed as threatened) occurs in four locations within the Porter Hills coniferous stands. These stands are dominated by Douglas firs or red cedar. While golden paintbrush (*Castilleja levisecta*) (federally listed as threatened and state-listed as endangered) has not been identified at the installation, it has the potential to occur in oak/grasslands.

Wetlands. Thirty-five wetlands totaling 138.34 acres occur at McChord AFB. Most of the wetlands are classic "kettle hole wetlands," which are influenced by groundwater. Surface water-influenced wetlands include those wetlands associated with Morey Pond, Morey Creek, and Clover Creek (62 CES/CEV 2003a).

Kettle hole wetlands are characterized by distinct vegetation zones. Garry oak woodland occurs on the upland edge. Moving towards the wetter areas, oaks grade into an Oregon ash (*Fraxinus latifolia*) zone with increasing soil moisture. Quaking aspen (*Populus tremuloides*), black cottonwood (*Populus trichocarpa*), and crab apple (*Pyrus fusca*) are common in this zone. Shrub-dominated communities occur where ash, aspen, and cottonwood trees subside on the increasing soil moisture gradient. Hardhack (*Spirea douglassi*) and willow (*Salix* spp.) are dominant in this zone. In some wetlands, an emergent zone composed of sedges (*Carex* spp.), forget-me-not (*Myostis laxa*), hemlock water-parsnip (*Sium suave*), and spatterdock (*Nuphar luteum*) occurs in the wettest portion of the wetland. Often this emergent zone is interspersed with willow and spirea thickets forming a mosaic of emergent and shrub communities. During the winter, spring, and early summer, these emergent zones provide open water habitat for waterfowl and other animals. However, some wetlands are not characterized by zonation. For example, the Talbot wetland in the South Approach Zone is forested with a lush herbaceous understory. Soils are saturated to the surface in this wetland year round (Rolph 1996).

The large kettle hole wetlands complex (composed of Bensten, Talbot, Hassett, Woods, Beef, and 166th Street wetland) in the South Approach Zone is the highest quality wetland complex at the installation. These wetlands are the most intact and have the largest extent of upland communities. These wetlands likely have the best protection from hydrologic changes and invasive species introductions. Other kettle hole wetlands that are in fairly good condition include the Mondress, Skeet Range, Draper, and Holiday Park wetlands (Rolph 1996).

Wetlands on McChord AFB support a diversity of plant species and communities. Sedge meadows, ash forests, and spirea and willow swamps are characteristic of some of the historic native wetland communities in Puget Sound lowlands. The abundance and distribution of these communities has decreased drastically over the past 150 years. A federally threatened plant species, water howellia, occurs in the emergent zone of lower Bensten on McChord AFB. McChord AFB wetlands might be in the historical range of the federally endangered plant species, swamp sandwort (*Arenaria paludicola*), though this species is not known to occur in Washington today (Rolph 1996).

McChord AFB wetlands also provide valuable habitat for a variety of animal species. The state-threatened western gray squirrel occurs in wetlands surrounded by oak woodlands. The wetlands are also used by deer. There are signs of beavers at Bensten in the South Approach Zone. During the winter and early spring, the ponded water in the kettle hole wetlands provides habitat for waterfowl. In the spring, neotropical migratory birds as well as resident birds nest and feed in the shrub and forest-dominated wetlands. Wetlands also function as the breeding grounds for a wide variety of insect and amphibian species (Rolph 1996).

3.8 Cultural Resources

3.8.1 Definition of the Resource

"Cultural resources" is an umbrella term for many heritage-related resources. The NHPA focuses on "historic properties," specifically, prehistoric or historic districts, sites, buildings, or structures included in, or eligible for, the NRHP, including related artifacts, records, and material remains. Traditional, religious, and cultural properties holding significance for Native American tribes, Native Alaskan, and Native Hawaiian organizations can also be considered NRHP-eligible. Depending on the condition and historic use, such resources might provide insight into living conditions in previous civilizations or might retain cultural and religious significance to modern groups.

Several Federal laws and regulations govern protection of cultural resources, including the NHPA (1966), the Archaeological and Historic Preservation Act (1974), the American Indian Religious Freedom Act (1978), the Archaeological Resources Protection Act (1979), and the Native American Graves Protection and Repatriation Act (NAGPRA) (1990).

Typically, cultural resources are subdivided into archaeological resources (prehistoric or historic sites where human activity has left physical evidence of that activity but no structures remain standing); architectural resources (buildings or other structures or groups of structures, or designed landscapes that are of historic or aesthetic significance); or resources of traditional, religious, or cultural significance to Native American tribes.

Archaeological resources comprise areas where human activity has measurably altered the earth or deposits of physical remains are found (e.g., projectile points and bottles).

Architectural resources include standing buildings, bridges, dams, and other structures of historic or aesthetic significance. Generally, architectural resources must be more than 50 years old to be considered for the NRHP. More recent structures, such as Cold War-era resources, might warrant protection if they have the potential to gain significance in the future.

Resources of traditional, religious, or cultural significance to Native American tribes can include archaeological resources, structures, neighborhoods, prominent topographic features, habitat, plants, animals, and minerals that Native Americans or other groups consider essential for the preservation of traditional culture.

The EA process and the consultation process prescribed in Section 106 of the NHPA require an assessment of the potential impact of an undertaking on cultural resources and historic properties that are within the proposed project's Area of Potential Effect (APE), which is defined as the geographic area(s) "within which an undertaking may directly or indirectly cause alterations in the character or use of historic properties, if any such properties exist." Under Section 110 of the NHPA, Federal agencies are required to locate and inventory all resources under their purview that are recommended as eligible for inclusion in the NRHP on owned, leased, or managed property. In accordance with EO 12372, *Intergovernmental Review of Federal Programs*, determinations regarding the potential effects of an undertaking on historic properties are presented to the SHPO, federally recognized Native American tribes, and other interested parties.

3.8.2 Existing Conditions

McChord AFB has many cultural resources considered eligible for inclusion in the NRHP, including one historic district (147 acres), three individually eligible historic structures, one eligible Cold War-era

structure, and nine historic archaeological resources (MAFB 2004). Activities potentially affecting cultural resources must be coordinated with the Washington Department of Archaeology and Historic Preservation as the SHPO, FUB, and 62 CES/CEV.

Archaeological Resources. In 1993, McChord AFB contracted its first assessment of archaeological sensitivity of the lands within it boundaries (MAFB 2004). The assessment concluded that approximately 55 percent of the installation is so heavily disturbed that there is little potential for preservation of archaeological sites. An additional 25 percent of the installation acreage was noted as being disturbed, but to a lesser degree, and 20 percent was categorized as relatively undisturbed. An archaeological survey was recommended for 26 parcels considered to have potential for archaeological sites based on historic land use patterns. The report discusses in detail several potentially significant historic resources including the Sastuk farm, the shepherd station of the Hudson Bay Company's Puget Sound Agricultural Company, and the 1850s farmstead of George Gibbs.

In 1995, Argonne National Laboratory conducted a comprehensive inventory and evaluation of prehistoric and historic archaeological resources at McChord AFB (MAFB 2004). No evidence for prehistoric period archaeological deposits was encountered. Nine historic sites, two historic road segments, and one historic sheep station were recommended for further evaluation to determine their eligibility for listing in the NRHP.

In 2006, Tetra Tech EC, Inc., completed archaeological evaluations of four of these sites: the Roberts, Murray, Manteufel, and Benston homesteads. None of the four sites was recommended eligible for listing in the NRHP. The SHPO concurred with these findings (Whitlam 2007). The five remaining historic sites, two historic road segments, and the sheep station are all outside of the APE of the Proposed Action.

Architectural Resources. Three investigations focusing on the inventory and evaluation of historic structures have been completed at McChord AFB. In 1996, Geo-Marine, Inc., conducted a comprehensive study of 29 Cold War buildings and structures. Building 300 (Fighter Interceptor Squadron [FIS] alert hanger) was the only structure at McChord AFB interpreted as eligible for the NRHP under Criterion Consideration G; this building was associated with a nearly continuous significant alert mission from the first years of the Cold War to its end, was one of the first standardized FIS alert hangers erected nationwide, and was one of the few expanded to a double-squadron capacity (MAFB 2004).

In 1997, the USACE, Seattle District's Technical Center for Expertise for Preservation of Structures and Buildings conducted a cultural resources survey and evaluation of pre-1947 buildings and structures. A group of buildings and structures were identified as meeting NRHP Criteria A and/or C for associations with early air base planning, design, and operational requirements and, with respect to certain buildings, representing Public Works Administration Moderne style architecture (MAFB 2004). An NRHP nomination form for the McChord Field Historic District has been prepared; the boundaries of the proposed historic district are shown in **Figure 2-2**. Its significance, under NRHP Criterion A, derives from its association with the training of hundreds of pilots between 1939 and 1941 as part of the pre-World War II military build-up. Additionally, McChord AFB served as the country's largest bomber training base during World War II. The proposed district is also architecturally significant, under NRHP Criterion C, for its grouping of pre-1947 buildings located within the original base area. Many of these buildings and structures share similar design and construction characteristics and, as a result, the original base area represents a significant and distinguishable entity.

In 2006, the USACE, Seattle District's Technical Center for Expertise for Preservation of Structures and Buildings conducted a second inventory and evaluation of Cold War properties at McChord AFB, focusing on buildings constructed between 1947 and 1960 (McCroskey 2005). This study also identified

Building 300 (FIS alert hanger) as eligible for listing in the NRHP; in this case under Criteria A and C since the building had reached 50 years in age. The study also identified Building 830 (the radio transmitter building) as eligible for its Cold War associations under Criteria A and C. Built in 1939, Building 830 was previously evaluated as eligible in the 1997 survey.

Resources of Traditional, Religious, or Cultural Significance to Native American Tribes. The 2004 Integrated Cultural Resources Management Plan (ICRMP) for McChord AFB (MAFB 2004) states that "no Native American concerns are known to exist on McChord AFB" and indicates that Native American groups have been consulted about cultural resources on McChord AFB. Specifically, in January 1994, McChord AFB provided the Puyallup Tribe and the Nisqually Tribe copies of the 1993 cultural resources assessment completed for the base and requested comments. No known record of a response to this report exists from either tribe.

Base representatives also met with tribal representatives prior to converting air routes for C-17 operations. Native American representatives and the FAA agreed to the proposed changes.

Tribal leaders have been informed that they may request consultations with McChord AFB at any time. In accordance with NAGPRA and AFI 32-7065, should any unanticipated Native American human remains be encountered on the installation, the Cultural Resources Manager (CRM) will notify the SHPO and the appropriate Native American groups.

3.9 Socioeconomic Resources

3.9.1 Definition of the Resource

Socioeconomics. Socioeconomics is defined as the basic attributes and resources associated with the human environment, particularly characteristics of population and economic activity. Regional birth and death rates and immigration and emigration affect population levels. Economic activity typically encompasses employment, personal income, and industrial or commercial growth. Changes in these two fundamental socioeconomic indicators are typically accompanied by changes in other components, such as housing availability and the provision of public services. Socioeconomic data at county, state, and national levels permit characterization of baseline conditions in the context of regional, state, and national trends.

Data in three areas provide key insights into socioeconomic conditions that might be affected by a proposed action. Data on employment identify gross numbers of employees, employment by industry or trade, and unemployment trends. Data on personal income in a region can be used to compare the "before" and "after" effects of any jobs created or lost as a result of a proposed action. Data on industrial or commercial growth or growth in other sectors provide baseline and trend line information about the economic health of a region.

In appropriate cases, data on an installation's expenditures in the regional economy help to identify the relative importance of an installation in terms of its purchasing power and jobs base.

Demographics identify the population levels and changes to population levels of a region. Demographics data might also be obtained to identify a region's characteristics in terms of race, ethnicity, poverty status, educational attainment level, and other broad indicators.

Socioeconomic data shown in this chapter are presented at census tract, county, municipality, and state levels to characterize baseline socioeconomic conditions in the context of regional and state trends. Data

have been collected from previously published documents issued by Federal, state, and local agencies; and from state and national databases (e.g., U.S. Census Bureau).

Environmental Justice. EO 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations* (February 11, 1994) requires Federal agencies' actions substantially affecting human health or the environment to not exclude persons, deny persons benefits, or subject persons to discrimination because of their race, color, or national origin. The EO was created to ensure the fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies. Fair treatment means that no groups of people, including racial, ethnic, or socioeconomic groups, should bear a disproportionate share of the negative environmental consequences resulting from industrial, municipal, and commercial operations or the execution of Federal, state, tribal, and local programs and policies.

3.9.2 Existing Conditions

McChord AFB encompasses about 4,600 acres and supports approximately 14,773 active-duty, guardsmen and reserves, military dependents, civilians, and contractors. During Fiscal Year (FY) 2005, McChord AFB had a payroll of approximately $336 million. In addition, economic activities at McChord AFB indirectly created approximately 4,436 jobs. The total annual expenditures of McChord AFB in 2005 was more than $129 million. The total annual economic impact of McChord AFB in 2005 was more than $642 million (62 AW/PA 2006). The 2006 Washington Gross Domestic Product was approximately $253 billion (BEA 2006).

As of 2006, Pierce County had a 5.2 percent unemployment rate compared to a 4.9 percent unemployment rate for the state of Washington, and the total labor force of Pierce County was 373,600 persons (WEW 2007).

For the purposes of this EA, census tracts adjacent to the Proposed Action were determined to be the socioeconomic Region of Influence (ROI). All the census tracts evaluated for the Proposed Action are in Pierce County; the following tracts were evaluated: 714.03, 715.03, 717.06, 718.04, 718.06, 719.02, 720, 729.01, and 729.04. Employment data relevant to the ROI, Pierce County, and the state of Washington are provided in **Table 3-6.**

Residents living within the ROI hold all types of jobs; however, as would be expected, there is a larger percentage of persons employed in the Armed Forces in the ROI (15.5 percent) because of McChord AFB and Fort Lewis (see **Table 3-6**). The largest employment type in the ROI, Pierce County, and Washington is educational, health, and social services (22.3, 20.8, and 19.4 percent, respectively). Other employment types in the ROI resemble those of Pierce County and the state of Washington.

Environmental Justice. Census tracts are designed to be relatively homogenous units with respect to population characteristics, economic status, and living conditions at the time of establishment. They average about 4,000 inhabitants. For the purposes of the environmental justice analysis for this EA, the residents of the nine census tracts described above were evaluated. According to Census 2000 data, the population within the ROI was 53,070 persons (U.S. Census Bureau 2000a).

The population of Pierce County in 2000 was 700,820 and increased to 731,598 in 2005, an 8.5 percent increase (U.S. Census Bureau 2000b). Residents living in the ROI have a lower median household income ($35,244) and a lower per capita income ($18,085) compared to Pierce County and the statewide

Table 3-6. Employment Types in the ROI, Pierce County, and the State of Washington

Employment Types	ROI *	Pierce County	State of Washington
Employed Persons in Armed Forces	15.5	3.2	1.1
Employed Persons in Civilian Labor Force (by industry)			
Agriculture, forestry, fishing and hunting, and mining	1.1	1.0	2.5
Construction	5.9	7.7	7.0
Manufacturing	9.2	12.6	12.5
Wholesale trade	3.2	4.4	4.1
Retail trade	12.6	12.5	12.1
Transportation and warehousing, and utilities	6.2	6.9	5.4
Information	1.8	2.3	3.4
Finance, insurance, real estate, and rental and leasing	5.1	5.8	6.1
Professional, scientific, management, administrative, and waste management services	7.7	7.4	9.8
Educational, health, and social services	22.3	20.8	19.4
Arts, entertainment, recreation, accommodation and food services	9.9	7.7	7.9
Other services (except public administration)	5.7	5.1	4.8
Public administration	9.4	5.8	5.0

Source: U.S. Census Bureau 2000a

Note: * Census 2000 data are the most recent comprehensive employment data for the ROI.

average (see **Table 3-7**) (U.S. Census Bureau 2000b). The percent of residents in the ROI living below the poverty level is higher (16.1 percent) than Pierce County (10.5 percent) and the state of Washington (10.6 percent). The ROI has a higher percentage of Black or African American residents (14.0 percent) than Pierce County (7.0 percent) and Washington (3.2 percent). Other demographic data in the ROI when compared to Pierce County, and Washington, are similar (see **Table 3-7**).

3.10 Infrastructure

3.10.1 Definition of the Resource

Infrastructure consists of the physical structures and systems that enable a population in a specified area to function (e.g., transportation, electricity, natural gas, fuel, water, sanitary sewer, storm water, communications). Infrastructure is wholly human-made, with a high correlation between the type and extent of infrastructure and the degree to which an area is characterized as urban or developed. The availability of infrastructure and its capacity to support growth are generally regarded as essential to the

Table 3-7. Race and Economic Characteristics of Census Tract Residents, Pierce County, Washington State

Demographic and Social Indicators	ROI *	Pierce County	Washington
Total Population	53,070	700,820	5,894,121
Percent White	65.1	78.4	81.8
Percent Black or African American	14.0	7.0	3.2
American Indian Alaska Native	1.6	1.4	1.6
Asian	5.7	5.1	5.5
Native Hawaiian and Other Pacific Islander	1.9	0.8	0.4
Some other race	4.7	2.2	3.9
Percent Reporting 2 or more races	7.0	5.1	3.6
Percent below poverty	16.1	10.5	10.6
Per Capita Income	$18,085	$20,948	$22,973
Median Household Income	$35,244	$45,204	$45,776

Source: U.S. Census Bureau 2000a

Note: * Census 2000 data are the most recent comprehensive employment data for the ROI.

economic growth of an area. The infrastructure information contained in this section provides a brief overview of each infrastructure component and comments on its existing general condition. All infrastructure information was obtained from the *McChord AFB General Plan* (62 AW 2005a).

Solid waste management primarily deals with the availability of landfills to support a population's residential, commercial, and industrial needs. Alternative means of waste disposal might involve waste-to-energy programs or incineration. In some localities, landfills are designed specifically for, and are limited to, disposal of construction and demolition debris. Recycling programs for various waste categories (e.g., glass, metals, and papers) reduce reliance on landfills for disposal.

3.10.2 Existing Conditions

Airfield. McChord AFB has two runways. The primary runway, Runway 16/34, is a Class B runway and supports all regular aircraft operations at McChord AFB. The second runway is an assault strip and is located west of and parallel to the main runway. This runway is used infrequently by C-130 aircraft to practice shortfield landings. There are four aircraft parking ramps (B, J, C, and D ramps) at the northern end of the airfield, and one ramp (E Ramp) at the southern end of the airfield. There are nine taxiways (B, C, D, F, G, H, J, K, and L). Taxiway H is the main taxiway that runs parallel to Runway 16/34 on the western side, and is adjacent to the aircraft parking ramps. Taxiways B, C, and D run from Taxiway H across Runway 16/34 to the eastern side, and all three are connected to hazardous cargo storage pads.

Taxiway F is on the eastern side of Runway 16/34, running almost parallel and connects Taxiways G, B, C, and D. There are also numerous parking aprons.

The nature of airfield operations imposes certain constraints on land uses and facility heights in areas on or near the airfield. UFC 3-260-01, *Airfield and Heliport Planning and Design*, define areas that must remain clear of obstructions. The process of identifying hazards and restricting development in these areas promotes flying safety and minimizes the number of people and facilities exposed to danger. The areas of primary concern are the Primary Surface, Transitional Surface, Inner Horizontal Surface, APZs, and clear zones. In accordance with Federal Aviation Regulations, Part 77, *Objects Affecting Navigable Airspace*, subpart B, the FAA must be notified at least 30 days prior to all construction that affects air navigation at DOD airfields in the United States through submittal of the FAA Form 7460-1, *Notice of Proposed Construction or Alteration*. Existing airfield obstructions are identified, categorized, and mapped in the Airfield Obstruction Management System. This system is managed by the Base Community Planner, and currently contains 120 identified obstructions. Airfield waivers are also identified in this system.

Transportation. The Main Gate is at the beginning of West Entrance Road, which travels east and west, crosses over the railroad tracks, intersects Barnes Boulevard, and becomes Main Street. Main Street continues to the east, providing direct access to the Wing Headquarters Building, which is in the center of the old main base. Incoming commercial and truck traffic accesses McChord AFB via the new South Gate; outgoing commercial and truck traffic primarily uses the Main Gate. The East Gate will be closed and replaced by the South Gate accessed from the Cross-Base Highway. The Housing Gate is on Woodbrook Road and is planned for limited outgoing traffic only.

There is a hierarchy of streets on the installation: primary, secondary, and tertiary. Lincoln Boulevard, Main Street, and Barnes Boulevard function as the primary roads. Secondary roads consist of Outer Drive, Perimeter Road, Tuskegee Airman Boulevard, and Woodbrook Road. All other roads are considered tertiary roads. The installation has a Transportation Plan that provides for upgrades and improvements to pavements to minimize congestion and delay. In general, roadways and parking lots at McChord AFB are considered to be in good condition.

I-5 is the primary north-south transportation corridor west of the installation, affording easy access to McChord AFB. State Route 512 intersects I-5 and provides access to the northern portion of McChord AFB via the Steele Street interchange and local streets. The Main Gate is accessed from I-5 via Bridgeport Avenue. The South Gate is accessible from I-5 via Thorne Road/Murray Road (Exit 123) and 150th Street, and from the east via State Route 7 (Pacific Highway), Spanaway Loop Road, and Military Road. The surrounding communities of Lakewood, Parkland, and Spanaway have recently updated their Comprehensive Plans and reference McChord AFB. There are a couple of transportation projects that would have some impact on the installation. The most prominent is the proposed Cross-Base Highway. This project is identified as a priority project in Pierce County's Transportation Plan to facilitate east-west travel for residents of surrounding communities, promote efficient commercial truck traffic, and improve emergency vehicle access. The proposed alignment for this road would cut across the southern portion of the installation, between McChord AFB and Fort Lewis.

Electrical. Electrical power is supplied by Tacoma Public Utilities. There are three substations on the installation that convert the incoming 115-kilovolt (kV) transmission lines to 13.8 kV on base distribution lines. The City of Tacoma owns the incoming high-voltage transmission lines and the USAF owns the low-voltage distribution system on base. In addition, a small substation is located next to the central heating plant to step down the voltage for that facility. The remaining substation serves the MFH area. Distribution on the installation is a mix of underground and overhead lines. However, the distribution system primarily consists of aboveground power lines.

The 2003 Infrastructure Plan rated the system as degraded due to overhead lines in need of immediate repair, substations that cannot backfeed power adequately, and the 4,160-volt distribution is outdated at the Heat Plant (Building 734). The distribution system in the old housing area is as much as 50 years old and in need of replacement. There are some deficiencies on the east side of the runway that require replacement of a generator and switchgear and underground electrical distribution will be replaced to minimize disruptions to flightline operations. The feeder lines serving the industrial area are nearing capacity and need to be upgraded. When these feeder lines near capacity, the feeder line serving the WADS facility accepts some of the load. The aboveground power lines at the northwest corner of Barnes Boulevard and Main Street are very near Memorial Grove and interfere with the aesthetics of the memorial. In addition, approximately one-third of the installation's streetlights need to be replaced. Emergency generators are either in place or identified for placement to provide power to the system in the event of an electrical outage.

Natural Gas. Natural gas is supplied to the installation from Puget Sound Energy (PSE). The company also owns and operates the system on the installation. The primary user of natural gas is the central heating plant; however, numerous other facilities are currently using natural gas and many others are being converted from heating oil to natural gas for heating. The condition of the natural gas system is generally good.

Heating, Ventilation, and Air Conditioning. McChord AFB owns, operates, and maintains two central steam plants, Buildings 734 and 853. A majority of the steam lines are old and in need of replacement. Most facilities do not have air conditioning, except for critical facilities that require it. The 2004 Infrastructure Plan rated the system as degraded. While system maintenance is excellent, the rating is driven by the age of the system. In particular, the boiler controls are obsolete and replacement parts are no longer available.

Liquid Fuel. McChord AFB stores and distributes many types of fuel and cryogenics including jet fuel (JP-8), unleaded engine fuel (MOGAS), diesel fuel, liquid oxygen, and liquid nitrogen. The Liquid Fuels system is composed of a receipt filtration house, a bulk-storage tank farm of four tanks, a transfer system, and Type III hydrant-refueling systems with four operational tanks. McChord AFB has three active hydrant fueling systems with rated capacities of 1,200, 2,400, and 3,000 gallons per minute (gpm). U.S. Oil supplies aviation fuels to McChord AFB via pipeline from the Tacoma tide flats. McChord AFB also has the ability to receive fuels via tanker truck in the event of a pipeline outage. Diesel-powered emergency generators are either in place or identified for placement to provide power to the system in the event of an electrical outage. The system also includes a GOV service station. The 2003 Civil Engineering Squadron Infrastructure Plan rated the system as adequate.

Water Supply. McChord AFB's water supply system is served by 11 wells: three in the housing area, two wells in the WADS area, five in the main base area, and one at Signal Hill (Mars Hill). Three additional irrigation wells serving the golf course facilities and grounds are not connected to the primary wells and distribution system. Distribution mains range from 6-inch to 14-inch diameter pipe and are cast iron or transite pipe. The installation's water system includes five elevated storage tanks with a total capacity of 1.265 million gallons. The water system is generally in good condition. With the exception of inadequate systemwide storage capacity, the water system requires basic upgrades and maintenance. The drinking water system has been rated as degraded. The system was noted as having inadequate chlorine contact time, inadequate capacity, and localized deposits of iron and manganese sediments in the lines.

Sanitary Sewer and Wastewater Systems. The sanitary sewer system is composed of 18 lift stations and approximately 30 miles of sewer lines. The collection and transmission lines range in size from 3 to 16 inches in diameter. McChord AFB does not maintain or operate treatment facilities with the exception

of small septic systems at isolated facilities. A project has been programmed to connect these facilities to the sanitary sewer and remove the septic systems. The main lift station pumps wastewater to the treatment facility at neighboring Fort Lewis. The FY03 peak daily treatment was 5.4 million gallons. The Fort Lewis treatment plant design is 7 million gallons per day (mgd) with a hydraulic design of 15 mgd. Under a support agreement, McChord AFB discharges wastewater to the Fort Lewis Government Owned Treatment Works (GOTW). The 62 AW Instruction 32-15 addresses the responsibilities of wastewater-generating activities on McChord AFB in terms of waste stream characterization, pollution prevention, pretreatment requirements, and monitoring. The sanitary sewer system is rated as adequate.

Storm Water Systems. Most of McChord AFB lies within the Clover Creek drainage. There are 35 outfalls delivering storm water discharge from areas of McChord AFB. Each of these outfalls is a monitored compliance point for the base's NPDES permit (Permit No. WAR05A55F). There are approximately 40 oil/water separators installed throughout the storm drainage system. The storm water system has been rated as adequate.

Communications. McChord AFB's communications system consists of telephone, data networking, radio, and resource protection. The installation is currently moving toward a single-line concept where people have their own line including voice mail. This upgrade began in the mission area and is now in the process of incorporating the southern portion of the installation into the system. Approximately 72 percent of the installation has been upgraded to this type of system. Two data rings provide the backbone of the data networking system at McChord AFB. The infield is on one data ring and the balance of the installation is on the second data ring.

Solid Waste Management. Solid waste is transported to an off-installation waste facility by a private contractor. There are no on-installation landfills or hardfills in operation. The Aerial Port Squadron removes solid wastes from aircraft arriving from overseas. The waste is removed in plastic bags after clearance is granted by U.S. Department of Agriculture inspectors. The waste is then autoclaved and picked up by the installation's solid waste contractor. Medical and dental clinic wastes generated on the installation are picked up weekly by a local medical waste contractor. Construction and demolition debris such as concrete, asphalt, and steel rebar is also recycled at McChord AFB. Construction materials that cannot be recycled are disposed of in a landfill.

McChord AFB operates a comprehensive Qualified Recycling Program operated under contract using Pollution Prevention and family housing funding. The program recycles an average of 300 tons per month. The Recycling Center, Building 516, was constructed in 1994 and is operated by the recycling contractor. A Recycling Staging Facility, Building 515, was constructed in 2000 allowing collection of large volumes of recyclables to facilitate bulk sales. Recyclable materials are collected at recycling collection points. These materials are picked up by the contractor and processed through the recycling center. The center also provides a drop-off service for base customers. The contractor then markets the recyclables, selling commodities to local and regional markets. Ninety-five-gallon containers for commingled recyclable materials and yard wastes are provided to each house in MFH. Residents can also drop off excess yard waste and other recyclables at Building 516. Materials picked up by the contractor at curbside in MFH are taken directly off the installation for processing. Yard wastes are taken to a Puyallup composting facility.

Pollution Prevention. AFI 32-7080, *Pollution Prevention Program*, implements the regulatory mandates in the Emergency Planning and Community Right-to-Know Act; Pollution Prevention Act of 1990; EO 12873, *Federal Acquisition, Recycling, and Waste Prevention*; and EO 12902, *Energy Efficiency and Water Conservation at Federal Facilities*. In part, these mandates require the USAF to procure, to the greatest extent practical, recycled or energy-efficient goods for administrative and construction activities.

AFI 32-7080 prescribes the establishment of pollution prevention management plans. McChord AFB has a Pollution Prevention Management Action Plan that complies with these mandates (62 AW 2005a).

3.11 Hazardous Materials and Wastes

3.11.1 Definition of the Resource

Hazardous materials are defined by 49 CFR 171.8 as "hazardous substances, hazardous wastes, marine pollutants, elevated temperature materials, materials designated as hazardous in the Hazardous Materials Table (49 CFR 172.101), and materials that meet the defining criteria for hazard classes and divisions" in 49 CFR Part 173. Transportation of hazardous materials is regulated by the U.S. Department of Transportation regulations within 49 CFR Parts 105–180.

Hazardous wastes are defined by the Resource Conservation and Recovery Act (RCRA) at 42 U.S.C. §6903(5), as amended by the Hazardous and Solid Waste Amendments, as "a solid waste, or combination of solid wastes, which because of its quantity, concentration, or physical, chemical, or infectious characteristics may (A) cause, or significantly contribute to an increase in mortality or an increase in serious irreversible, or incapacitating reversible, illness; or (B) pose a substantial present or potential hazard to human health or the environment when improperly treated, stored, transported, or disposed of, or otherwise managed." Certain types of hazardous wastes are subject to special management provisions intended to ease the management burden and facilitate the recycling of such materials. These are called universal wastes and their associated regulatory requirements are specified in 40 CFR Part 273. Four types of waste are currently covered under the universal waste regulations: hazardous waste batteries, hazardous waste pesticides that are either recalled or collected in waste pesticide collection programs, hazardous waste thermostats, and hazardous waste lamps.

Special hazards are those substances that might pose a risk to human health but are not regulated as contaminants under the hazardous waste statutes. Special hazards include asbestos-containing material (ACM) and lead-based paint (LBP). The presence of special hazards or controls over them might affect, or be affected by, a proposed action. Information on special hazards describing their locations, quantities, and condition assists in determining the significance of a proposed action.

DOD has developed the ERP, which is intended to facilitate thorough investigation and cleanup of contaminated sites on military installations. Through the ERP, DOD evaluates and cleans up sites where hazardous wastes have been spilled or released to the environment. A description of ERP activities provides a useful gauge of the condition of soils, water resources, and other resources that might be affected by contaminants. It also aids in identification of properties and their usefulness for given purposes (e.g., activities dependent on groundwater usage might be restricted until remediation of a groundwater contaminant plume has been completed).

For the USAF, AFPD 32-70, *Environmental Quality*, and the AFI 32-7000 series incorporate the requirements of all Federal regulations, and other AFIs and DOD Directives for the management of hazardous materials, hazardous wastes, and special hazards. Evaluation will extend to generation, storage, transportation, and disposal of hazardous wastes when such activity occurs at or near the project site of the Proposed Action.

3.11.2 Existing Conditions

Hazardous Materials. AFI 32-7086, *Hazardous Materials Management*, establishes procedures and standards to govern management of hazardous materials throughout the USAF. It applies to all USAF personnel who authorize, procure, issue, use, or dispose of hazardous materials; and to those who manage,

monitor, or track any of those activities. The Spill Prevention, Control, and Countermeasures Plan (SPCCP) outlines procedures to be followed, specifically for POL, to prevent the occurrence of a spill, control measures to prevent a spill from entering navigable waters, and countermeasures for clean up and mitigation at McChord AFB (62 CES/CEV 2006a). Other planning and procedural documents include a Facility Response Plan, Hazardous Waste Management Plan, Contingency Action Plan, Storm Water Pollution Prevention Plan (SWPPP), and the Oil and Hazardous Substance Pollution Contingency/Facility Response Spill Plan.

To reduce hazardous and toxic material procurements at McChord AFB, materials are approved and tracked by the hazardous materials pharmacy (HAZMART), which serves as a centralized entry and distribution point in accordance with AFI 32-7086. All hazardous materials are segregated per compatibility requirements.

Hazardous Wastes. McChord AFB produces a variety of wastes from aircraft maintenance, base transportation, and civil engineering activities. Wastes include spent solvents, contaminated fuels, stripping chemicals, waste paint, oils and lubricants, and medical biohazard waste. AFI 32-7042, *Solid and Hazardous Waste Compliance*, identifies requirements for handling hazardous wastes at USAF installations. McChord AFB's *Hazardous Waste Management Plan*, MAFB SPLAN 1911-06, deals with key points in implementing the complex area of hazardous waste management required by RCRA. The plan covers the control and management of hazardous materials from the point they become hazardous wastes at the point of generation to the point of ultimate disposal. The scope of the plan is implementation of the USEPA's philosophy of "cradle-to-grave" management and control of hazardous waste (62 CES/CEV 2006b).

McChord AFB is classified as a large quantity generator of hazardous wastes, meaning that they generate more than 2,200 pounds per month. Because the installation does not have a RCRA Part B Storage Permit, hazardous wastes generated cannot legally be stored for greater than 90 days at which point they are transported off the installation by a licensed transporter or taken to the Defense Reutilization and Marketing Office (DRMO) at adjacent Fort Lewis (62 CES/CEV 2006b, 62 AW 2005a).

Hazardous wastes are stored in waste containers at the accumulation points, also known as satellite accumulation points (SAPs), set up at or near buildings where wastes are generated. Individual waste-generating units and 62 CES/CEV are responsible for managing the hazardous wastes. Each generating organization appoints an accumulation point manager and an alternate manager to ensure the proper identification, handling, storage, and recordkeeping related to the hazardous waste pursuant to AFI 32-7005. The generating organization is responsible for transporting the hazardous wastes to the less than 90-day accumulation site. The plan also establishes requirements and procedures for civilian contractors. It is important that contractors maintain communication with the 62 CES/CEV regarding hazardous waste generation on projects in order that the proper disposal methods and timeframe (less than 90 days) are met (62 CES/CEV 2006b).

Asbestos-Containing Material. Asbestos is a naturally occurring mineral found in nature. It has historically been used in building materials because asbestos is fire-resistant, has high tensile strength, has low heat, has electrical conductivity, and is generally impervious to chemical attack. Asbestos can be easily broken down, inhaled, and trapped in the lungs. Once trapped in the lungs, asbestos has been determined to cause lung cancer.

In accordance with USEPA guidelines for maintaining and removing ACM, the USAF developed AFI 32-1052, *Facility Asbestos Management*. This comprehensive plan provides the direction for asbestos management at USAF installations. AFI 32-1052 incorporates by reference the applicable requirements of 29 CFR Part 669 et seq., 29 CFR 1910.1025, 29 CFR 1926.58, 40 CFR 61.3.80, Section 112 of the

CAA, and other applicable AFIs and DOD Directives. AFI 32-1052 requires each installation to develop an asbestos management plan to maintain a permanent record of the status and condition of all ACM in installation facilities, record asbestos management efforts, and detail asbestos removal plans.

The Asbestos Management Plan (AMP), MAFB SPLAN 32-1052-97, is designed to protect personnel who live and work on McChord AFB from exposure to airborne asbestos fibers as well as to ensure the installation remains in compliance with Federal, state, and local regulations pertaining to asbestos. It specifies procedures for the testing, removal, encapsulation, enclosure, and repair activities associated with ACM-abatement projects, as well as actions to safely manage ACM in place (62 CES/CEV 2003b, 62 AW 2005a).

The McChord AFB AMP is based on an ACM survey completed between 1987 and 1989, which surveyed representative MFH facilities and all other facilities. Many facilities were found to contain ACM. Records for the ACM present at McChord AFB are maintained and updated by the 62 CES/CEV and Bioenvironmental Engineering (62 CES/CEV 2003b).

Lead-Based Paint. In October 1992, Congress passed The Residential Lead-Based Paint Hazard Reduction Act of 1992, as promulgated in 40 CFR Part 745, and 24 CFR Part 35 which requires disclosure by persons selling or leasing housing constructed before the phaseout of residential LBP use in 1978 if known LBP or LBP hazards exist. This act, commonly called Title X, requires Federal agencies to comply with Federal, state, and local laws relating to LBP activities and hazards.

USAF policy requires that installations have specific procedures for managing facilities with LBP and protecting personnel from the hazards associated with deteriorated LBP. The USAF LBP plans were designed to establish management and organizational responsibilities and procedures for ensuring that personnel in installation facilities and contractor personnel are not exposed to excessive levels of lead. The plan's focus is on taking positive action to deal with current and near-term lead management needs, as well as planning for removal of LBP from installation facilities. The LBP Management Plan focuses on protecting children from LBP and preventing facility occupants from exposure to LBP.

The 62 CES/CEV is responsible for the overall management of the LBP program. Bioenvironmental Engineering is responsible for conducting sampling and analysis. Reportedly, all painted surfaces in the housing area and in other buildings on the installation are in good condition (62 AW 2005a).

Though exposure to LBP is not expected to occur because of current management practices and the minimal use of LBP, exposure from LBP could occur from deteriorating LBP previously applied or during occupational operations (sanding or other type of disturbance to paint containing lead). It is the responsibility of the project planners, designers, and workers to know where LBP might be encountered (AMC 1994). Therefore, all suspect or confirmed LBP is addressed prior to any activities that might disturb it, such as renovation or demolition.

Radon. Radon is a naturally occurring radioactive gas that develops in soils and rocks as uranium decays. Radon has the tendency to accumulate in enclosed spaces that are generally below ground and have poor ventilation (e.g., basements). Radon is an odorless, colorless gas that has been determined to increase the risk of developing lung cancer. USEPA has established a guidance radon level of 4 picocuries per liter (pCi/L) in indoor air for residences; however, there have been no standards established for commercial structures.

According to the USEPA Radon Zone map, the counties surrounding McChord AFB (King, Pierce, Thurston, and Lewis) have a low radon potential. Based on this assessment, USEPA has assessed that these counties have a predicted average indoor radon screening level less than 2 pCi/L (USEPA 2007).

However, in 1988 and 1990 the Radon Assessment and Mitigation Program identified 81 housing units as having radon concentrations above 3.2 pCi/L, resulting in the installation of ventilation to prevent or mitigate radon accumulation. A 1996 survey resulted in the repair of several of these ventilation systems which had become nonoperational (62 AW 2005a).

Polychlorinated Biphenyl (PCB). Federal law states that all oil-filled electrical equipment must be considered to be PCB-contaminated unless proven otherwise. In Washington, items having a PCB content greater than 2 ppm must be managed and disposed of as a dangerous waste, which is more conservative than the Federal definition of 50 to 499 ppm (62 CES/CEV 2006b). Procedures for PCBs are found in the 62d Civil Engineering Squadron Instruction (CESI) 32-11, *Handling, Storage, Transport, and Disposal of PCBs*. The identification and control of PCB and PCB-contaminated electrical equipment is a primary function of the Electrical Systems Section which manages the electrical distribution system for all of McChord AFB (62 CES/CEV 2006b).

As PCB-containing items are removed, they are transported to Building 562 for storage until analysis has been finished. Depending on the results, the oil can be burned for energy recovery or disposed of off the installation. In all, there are approximately 70 pounds of PCB waste generated annually from PCB ballasts from general interior lighting maintenance (62 CES/CEV 2006b).

Environmental Restoration Program. The Defense Environmental Restoration Program (DERP) was formally established by Congress in 1986 to provide for the cleanup of DOD property at active installations, Base Realignment and Closure (BRAC) installations, and formerly used defense sites throughout the United States and its territories. The three restoration programs under the DERP are the Installation Restoration Program (now called the ERP), Military Munitions Response Program (MMRP), and Building Demolition/Debris Removal (BD/DR). The ERP requires each installation to identify, investigate, and clean up contaminated sites. The MMRP addresses nonoperational military ranges and other sites that are suspected or known to contain UXO, discarded military munitions, or munitions constituents. BD/DR involves the demolition and removal of unsafe buildings and structures. Eligible DERP sites include those contaminated by past defense activities that require cleanup under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), as amended by the Superfund Amendments and Reauthorization Act (SARA)**,** and certain corrective actions required by RCRA. Non-DERP sites are remediated under the Compliance-Related Cleanup Program.

McChord AFB manages 65 sites under its ERP; all sites have remediation under way or no further action planned. Seven sites (LF-04, LF-05, LF-06, LF-07, OT-26, RW-35, OT-39) comprise the Area D/American Lake Garden Tract, which is on USEPA's National Priorities List. New facilities can be constructed within certain ERP sites depending upon the level of contamination, clean-up efforts, and land use controls. Approval of new construction within ERP sites must be obtained from the FUB and coordinated with the 62 CES/CEV.

4. Environmental Consequences

This section contains four subsections. **Section 4.1** provides a general introduction to the environmental consequences analysis, including significance criteria for each resource area. **Section 4.2** presents the No Action Alternative, which is prescribed by CEQ regulations. **Section 4.3** provides a general analysis of the environmental consequences by resource area. **Section 4.4** provides the detailed analysis of the Proposed Action, as presented in **Section 2.1**. Potential cumulative effects that could occur as a result of implementing the Proposed Action and other past, present, and reasonably foreseeable projects are in **Section 5**.

4.1 Introduction

The intention of this section of the IDEA is to present both a general analysis of the environmental effects of installation development activities (see **Section 4.3**), as well as a summary of site-specific environmental effects of individual installation development projects (see **Section 4.4**). The general analysis identifies the general environmental effects on each resource area of the ongoing demolition, construction, and infrastructure upgrade activities, with a focus on avoiding those areas that are constraints to development. However, a general analysis of potential development activities alone does not provide the framework to assess adequately the potential environmental consequences of a single proposed project. Therefore, **Section 4.4** presents a detailed analysis of the representative demolition, construction, and infrastructure upgrades introduced in **Sections 2.1.2**, **2.1.3**, and **2.1.4**, respectively, to provide a range of potential consequences that could be expected from implementing the proposed projects with the greatest potential for adverse environmental effects. The representative projects were selected for detailed analysis because they are large in scale or have a unique aspect (e.g., proposed location or operational characteristics) with the potential to result in adverse environmental effects. In addition, **Section 4.4** contains a summary in tabular form of the environmental impacts associated with projects identified over the next 5 years at McChord AFB (refer to **Appendix A**). The analysis presented in **Sections 4.3** and **4.4** provides the basis for the cumulative effects analysis in **Section 5**. The No Action Alternative is presented in **Section 4.2** before the Proposed Action in order to provide a comparison of the potential environmental consequences of implementing the Proposed Action against taking no action.

The specific criteria for evaluating potential environmental effects of the No Action Alternative or the Proposed Action are described in the following text, identified by resource area. The significance of an action is also measured in terms of its context and intensity. The context and intensity of potential environmental effects are described as follows in terms of duration, whether they are direct or indirect, the magnitude of the impact, and whether they are adverse or beneficial:

- ***Short-term or long-term.*** In general, short-term effects are those that would occur only with respect to a particular activity or for a finite period or only during the time required for construction or installation activities. Long-term effects are those that are more likely to be persistent and chronic.
- ***Direct or indirect.*** A direct effect is caused by an action and occurs around the same time at or near the location of the action. An indirect effect is caused by an action and might occur later in time or be farther removed in distance but still be a reasonably foreseeable outcome of the action.
- ***Minor, moderate, or significant.*** These relative terms are used to characterize the magnitude or intensity of an impact. A minor effect is slight, but detectable. A moderate effect is readily apparent. Significant effects are those that, in their context and due to their magnitude (severity), have the potential to meet the thresholds for significance set forth in CEQ regulations (40 CFR 1508.27) and, thus, warrant heightened attention and examination for potential means for

mitigation in order to fulfill the policies set forth in NEPA. Significance criteria by resource area are presented in the following text.

- ***Adverse or beneficial.*** An adverse effect is one having unfavorable or undesirable outcomes on the man-made or natural environment. A beneficial effect is one having positive outcomes on the man-made or natural environment.

The following text presents the criteria that would constitute a significant environmental effect resulting from implementation of the No Action Alternative (see **Section 4.2**), or the Proposed Action (either general demolition and construction activities as presented in **Section 4.3**, or any specific project as presented in **Section 4.4**). The same significance criteria are also applied to potential cumulative effects (see **Section 5**) of implementing the Proposed Action in conjunction with past, present, or reasonably foreseeable future actions.

Noise

Potential changes in the noise environment can be beneficial (i.e., if they reduce the number of sensitive receptors exposed to unacceptable noise levels), negligible (i.e., if the total area exposed to unacceptable noise levels is essentially unchanged), or adverse (i.e., if they result in increased noise exposure to unacceptable noise levels). Projected noise effects are evaluated quantitatively and qualitatively. An action would be considered significant if it resulted in increased noise levels that were not compatible with Federal regulation, state regulation, or local ordinance.

Land Use

The significance of potential land use effects is based on the level of land use sensitivity in areas affected by a proposed action and compatibility of proposed actions with existing conditions. In general, a land use effect would be significant if the following were to occur:

- Be inconsistent or in noncompliance with existing land use plans or policies
- Preclude the viability of existing land use
- Preclude continued use or occupation of an area
- Be incompatible with adjacent land use to the extent that public health or safety is threatened
- Conflict with planning criteria established to ensure the safety and protection of human life and property.

As discussed in **Section 3.1.1**, DNL is the preferred noise metric of the FAA, HUD, the USEPA, and DOD for modeling airport environs. According to USAF, FAA, and HUD criteria, residential units and other noise-sensitive land uses are “clearly unacceptable” in areas where the noise exposure exceeds DNL of 75 dBA, “normally unacceptable” in regions exposed to noise between the DNL of 65 to 75 dBA, and “normally acceptable” in areas exposed to noise where the DNL is 65 dBA or less (USDOT 1984).

Air Quality

The environmental consequences on local and regional air quality conditions near a proposed Federal action are determined based upon the increases in regulated pollutant emissions relative to existing conditions and ambient air quality. The effect in NAAQS attainment areas would be considered significant if the net increases in pollutant emissions from the Federal action would result in any one of the following scenarios:

- Cause or contribute to a violation of any national or state ambient air quality standard
- Expose sensitive receptors to substantially increased pollutant concentrations
- Represent an increase of 10 percent or more in an affected AQCR emissions inventory
- Exceed any Evaluation Criteria established by a SIP.

With respect to the General Conformity Rule, effects on air quality would be considered significant if a proposed action would result in an increase of a nonattainment or maintenance area's emissions inventory by 10 percent or more for one or more nonattainment pollutants, or if such emissions exceed *de minimis* threshold levels established in 40 CFR 93.153(b) for individual nonattainment pollutants or for pollutants for which the area has been redesignated as a maintenance area.

The *de minimis* threshold emissions rates were established by USEPA in the General Conformity Rule to focus analysis requirements on those Federal actions with the potential to have "significant" air quality impacts. **Table 4-1** presents these thresholds, by regulated pollutant. These *de minimis* thresholds are similar, in most cases, to the definitions for major stationary sources of criteria and precursors to criteria pollutants under the CAA's New Source Review Program (CAA Title I). As shown in **Table 4-1**, *de minimis* thresholds vary depending upon the severity of the nonattainment area classification. No *de minimis* threshold emissions rate has been established by USEPA for $PM_{2.5}$.

Table 4-1. Conformity *de minimis* Emissions Thresholds

Pollutant	Status	Classification	*de minimis* Limit (tpy)
O_3 (measured as NO_x or VOCs)	Nonattainment	Extreme Severe Serious Moderate/marginal (inside ozone transport region) All others	10 25 50 50 (VOCs)/100 (NO_x) 100
	Maintenance	Inside ozone transport region Outside ozone transport region	50 (VOCs)/100 (NO_x) 100
CO	Nonattainment/ maintenance	All	100
PM_{10}	Nonattainment/ maintenance	Serious Moderate Not Applicable	70 100 100
SO_2	Nonattainment/ maintenance	Not Applicable	100
NO_x	Nonattainment/ maintenance	Not Applicable	100

Source: 40 CFR 93.153

In addition to the *de minimis* emissions thresholds, Federal PSD regulations define air pollutant emissions to be significant if the source is within 10 kilometers of any Class I area, and emissions would cause an increase in the concentration of any regulated pollutant in the Class I area of 1 $\mu g/m^3$ or more (40 CFR 52.21(b)(23)(iii)). As stated in **Section 3.3.1**, there are no Class I areas within 10 kilometers of McChord AFB, so this significance criterion was not used for this analysis.

Safety

Any increase in safety risks would be considered an adverse effect on safety. An effect would be significant if an action were to substantially increase risks associated with the safety of construction personnel, contractors, or the local community; substantially hinder the ability to respond to an emergency; or introduce a new health or safety risk for which the installation is not prepared or does not have adequate management and response plans in place.

Geological Resources

Protection of unique geological features, minimization of soil erosion, and the siting of facilities in relation to potential geologic hazards are considered when evaluating potential effects of a proposed action on geological resources. Generally, adverse effects can be avoided or minimized if proper construction techniques, erosion-control measures, and structural engineering design are incorporated into project development.

Effects on geology and soils could be potentially significant if they would alter the lithology, stratigraphy, and geological structure that control groundwater quality, distribution of aquifers and confining beds, and groundwater availability; or change the soil composition, structure, or function within the environment.

Water Resources

Evaluation criteria for effects on water resources are based on water availability, quality, and use; existence of floodplains; and associated regulations. A proposed action would have significant effects on water resources if it were to do one or more of the following:

- Substantially reduce water availability or supply to existing users
- Overdraft groundwater basins
- Exceed safe annual yield of water supply sources
- Substantially affect water quality adversely
- Endanger public health by creating or worsening health hazard conditions
- Threaten or damage unique hydrologic characteristics
- Violate established laws or regulations adopted to protect water resources.

The potential effect of flood hazards on a proposed action is important if such an action occurs in an area with a high probability of flooding.

Biological Resources

The significance of effects on biological resources is based on the following:

- The importance (i.e., legal, commercial, recreational, ecological, or scientific) of the resource
- The proportion of the resource that would be affected relative to its occurrence in the region

- The sensitivity of the resource to proposed activities
- The duration of ecological ramifications.

Effects on biological resources would be significant if species or habitats of high concern are adversely affected over relatively large areas. Effects would also be considered significant if disturbances cause reductions in population size or distribution of a species of high concern.

Ground disturbance and noise associated with construction can directly or indirectly cause adverse effects on biological resources. Direct effects from ground disturbance are evaluated by identifying the types and locations of potential ground-disturbing activities in correlation to important biological resources. Habitat removal and damage or degradation of habitats might be adverse effects associated with ground-disturbing activities.

As a requirement under the ESA, Federal agencies must provide documentation that ensures that agency actions will not adversely affect the existence of any threatened or endangered species. The ESA requires that all Federal agencies avoid "taking" threatened or endangered species (which includes jeopardizing threatened or endangered species habitat). Section 7 of the ESA establishes a consultation process with the USFWS that ends with USFWS concurrence or a determination of the risk of jeopardy from a Federal agency project. The "take" of a federally protected species under the ESA would be considered significant.

The significance of effects on wetland resources is proportional to the functions and values of the wetland complex. Quantification of wetlands functions and values, therefore, is based on the ecological quality of the site as compared with similar sites, and the comparison of the economic value of the habitat with the economic value of the proposed activity that would modify it. A significant adverse effect on wetlands would occur should either the major function or value of the wetland be substantially altered.

Cultural Resources

Under Section 106 of the NHPA, adverse effects on historic properties can include physically altering, damaging, or destroying all or part of a resource; altering characteristics of the surrounding environment that contribute to the resource's significance; introducing visual or audible elements that are out of character with the property or that alter its setting; neglecting the resource to the extent that it deteriorates or is destroyed; or the sale, transfer, or lease of the property out of agency ownership (or control) without adequate legally enforceable restrictions or conditions to ensure preservation of the property's historic significance.

For assessing the impacts of the Proposed Action on archaeological resources, the APE is confined to the footprint of any proposed ground-disturbing activity (e.g., construction, grading in advance of paving, and excavation for new underground utilities). The APE for analysis of impacts on architectural resources includes buildings and structures that would be renovated or demolished, as well as historic buildings or structures with viewsheds that include the areas of proposed projects or that could be impacted by noise or vibration. The APE for analysis of impacts on resources of traditional, religious, or cultural significance to Native American tribes includes both those areas that would be impacted directly by ground disturbance as well as the viewshed and general setting of those resources.

Under NEPA, impacts on cultural resources are assessed as short term or long term; direct or indirect; and minor, moderate, or significant. Under Section 106 of the NHPA, the Proposed Action might have no effect, no adverse effect, or an adverse effect on historic properties.

Socioeconomic Resources

Construction expenditures are assessed in terms of direct effects on the local economy and related effects on other socioeconomic resources (e.g., housing). The magnitude of potential impacts can vary greatly, depending on the location of a proposed action. For example, implementation of an action that creates ten employment positions might go unnoticed in an urban area, but could have considerable impacts in a rural region. If potential socioeconomic changes were to result in substantial shifts in population trends or a decrease in regional spending or earning patterns, those effects would be considered adverse. A proposed action could have a significant effect with respect to the socioeconomic conditions in the surrounding ROI if the following were to occur:

- Change the local business volume, employment, personal income, or population that exceeds the ROI's historical annual change
- Adversely affect social services or social conditions, including property values, school enrollment, county or municipal expenditures, or crime rates
- Disproportionately impact minority populations or low-income populations.

Infrastructure

Effects on infrastructure are evaluated based on their potential for disruption or improvement of existing levels of service and additional needs for energy and water consumption, sanitary sewer and wastewater systems, and transportation patterns and circulation. Impacts might arise from physical changes to circulation, construction activities, introduction of construction-related traffic on local roads or changes in daily or peak-hour traffic volumes, and energy needs created by either direct or indirect workforce and population changes related to installation activities. In considering the basis for evaluating the significance of effects on infrastructure resources, several items are considered. These items include, for example, evaluating the degree to which the proposed construction projects could affect the existing solid waste management program and capacity of the area landfill. An effect might be considered adverse if a proposed action exceeded capacity of a utility.

Hazardous Materials and Wastes

Effects on hazardous materials and waste management would be considered significant if the Federal action resulted in noncompliance with applicable Federal and state regulations, or increased the amounts generated or procured beyond current McChord AFB waste management procedures and capacities. Effects on pollution prevention would be considered significant if the Federal action resulted in worker, resident, or visitor exposure to these materials, or if the action generated quantities of these materials beyond the capability of current management procedures. Effects on the ERP would be considered significant if the Federal action disturbed (or created) contaminated sites resulting in adverse effects on human health or the environment. Effects on fuels management would be significant if the established management policies, procedures, and handling capacities could not accommodate the proposed activities.

4.2 Environmental Consequences of the No Action Alternative

Under the No Action Alternative, McChord AFB would not implement the projects proposed in the installation's community of plans, which would result in the continuation of existing conditions as described in **Section 3**. No direct environmental effects would be expected on the noise environment, land use, air quality, safety, geological resources, water resources, biological resources, cultural resources, socioeconomic resources, infrastructure, and hazardous materials and wastes. It is anticipated

that future development would occur under the No Action Alternative, but those development projects would be analyzed through the preparation of project-specific NEPA documentation, as appropriate.

4.3 General Environmental Consequences of the Proposed Action by Resource Area

4.3.1 Noise

Intermittent short-term minor adverse effects from noise would be expected from the implementation of the Proposed Action.

Construction Noise. As discussed in **Section 3.1.1**, building construction, modification, and demolition work can cause noise emissions above ambient sound levels. Projects under the Proposed Action would require grading, paving, demolition, and building construction. All of the projects under the Proposed Action would occur on McChord AFB property. Some of these would occur close to military housing.

Noise from construction activities varies depending on the type of construction equipment being used, the area that the project would occur in, and the distance from the source. To predict how these activities would impact adjacent populations, noise from the probable construction was estimated. For example, as shown on **Table 3-1**, building construction usually involves several pieces of equipment (e.g., saws and haul trucks) which can be used simultaneously. Under the Proposed Action, the cumulative noise from the construction equipment, during the busiest day, was estimated to determine the total impact of noise from building activities at a given distance. The majority of projects are proposed in the center of the installation. Populations several hundred feet away from the construction site could experience noise levels in the 70-dBA range and those adjacent to the project site could experience noise levels in the mid-80-dBA range. Examples of expected construction noise during daytime hours are as follows:

- Off-installation residences on McChord Drive would be approximately 500 feet west of Building 1104 (Project D10) and would experience noise levels of approximately 70 dBA during demolition activities.
- On-installation populations would be approximately 50 feet west of the existing Health and Wellness Center and pool house (Project D3) and would experience noise levels of approximately 90 dBA during demolition activities.
- Off-installation residents on McChord Drive would be approximately 300 feet northwest of the bulk fuels storage and distribution facilities (Project I3) site and would experience noise levels of approximately 74 dBA during construction activities.
- On-installation populations approximately 100 feet west of the bulk fuels storage and distribution facilities (Project I3) would experience noise levels of approximately 84 dBA during demolition activities.
- Off-installation residents northwest of the installation (approximately 1,400 feet) on McChord Drive would experience noise levels of approximately 57 dBA during the construction of the Communications Squadron Facility (Project C8).
- On-installation populations south of the proposed Central Deployment Facility (Project C9) would be approximately 100 feet from construction site and would experience noise levels of approximately 79 dBA during these activities.

Given the extent of the projects under the Proposed Action and the proximity to residents on the installation, adverse effects from construction noise are unavoidable. However, noise generation would

last only for the duration of construction activities and could be reduced through the use of equipment exhaust mufflers and restriction of construction activity to normal working hours (i.e., between 7:00 a.m. and 5:00 p.m.).

Operational Impacts. Once the projects under the Proposed Action are completed, the ambient noise level would return to its normal level. It is not anticipated that automobile traffic or aircraft operations would increase under the Proposed Action. No long-term effects on the ambient noise environment are anticipated as a result of the Proposed Action.

4.3.2 Land Use

Significant adverse effects would not be expected to occur on land use with the implementation of the Proposed Action. The Proposed Action would occur entirely on McChord AFB property. The proposed projects would be sited in a manner compatible with McChord AFB's surrounding land uses and would avoid sensitive or constrained areas to the extent practicable.

Construction projects C9, C10, and C23 are within the DNL of 65 dBA noise contour at McChord AFB based on the 1998 AICUZ Study. Project C9 would consist of the construction of the Central Deployment Facility, Project C10 would include the construction of the Fire Station, and Project C23 would include the expansion of the mezzanine. Projects C22 and C24 are adjacent to the 65-dBA noise contour; consequently, potential increases in aircraft operations at McChord AFB could increase the noise levels above 65 dBA at those sites. Project C22 consists of the construction of an EOD Facility, and Project C24 includes the expansion to Building 328.

Facilities and land uses on installations are generally categorized as government services in the *Standard Land Use Coding Manual* (SLUCM 1965). Government services are generally considered compatible in an area where DNL noise levels range between 65 to 69 dBA. However, the designation of "compatible" in this instance reflects individual Federal agency and program considerations of general cost and feasibility factors, as well as past community experiences and program objectives. According to AFI 32-7062, *Air Force Comprehensive Planning*, the site planning process must address potential noise impacts and consider the location of buildings. McChord AFB discourages development in locations where high noise levels might affect the proposed user (62 AW 2004).

The proposed demolition projects would open up land for future construction projects. As a result of full implementation of the Proposed Action, there would be approximately 468,760 ft^2 of demolished buildings at McChord AFB and approximately 911,890 ft^2 of new construction, which would result in an increase of approximately 443,130 ft^2 in additional facilities.

4.3.3 Air Quality

The Proposed Action would generate both temporary and long-term air pollutant emissions. The construction, demolition, and infrastructure projects related to the Proposed Action would generate air pollutant emissions as a result of grading, filling, compacting, trenching, demolition, and construction operations, but these emissions would be temporary and would not be expected to generate any off-site effects. The Proposed Action does not include a net increase in personnel or commuter vehicles. Therefore, the Proposed Action's emissions from existing personnel and commuter vehicles would not result in an adverse impact on regional air quality. Regulated pollutant emissions from the Proposed Action would not contribute to or affect local or regional attainment status with the NAAQS.

The construction projects would generate total suspended particulate and PM_{10} emissions as fugitive dust from ground-disturbing activities (e.g., grading, demolition, soil piles) and from combustion of fuels in

construction equipment. Fugitive dust emissions would be greatest during the initial site preparation activities and would vary from day to day depending on the construction phase, level of activity, and prevailing weather conditions. The quantity of uncontrolled fugitive dust emissions from a construction site is proportional to the area of land being worked and the level of construction activity.

Fugitive dust emissions for various construction activities were calculated using emissions factors and assumptions published in USEPA's AP-42 (USEPA 2006). These estimates assume that 230 working days are available per year for construction (accounting for weekends, weather, and holidays).

Construction operations would also result in emissions of criteria pollutants as combustion products from construction equipment, as well as evaporative emissions from architectural coatings and asphalt paving operations. These emissions would be of a temporary nature. The emissions factors and estimates were generated based on guidance provided in USEPA AP-42 (USEPA 2006).

Because McChord AFB is classified as a maintenance area for CO, General Conformity Rule requirements are applicable. However, the Proposed Action would generate emissions well below *de minimis* level. In addition, the Proposed Action would generate emissions well below 10 percent of the emissions inventories for the PSIAQCR and the emissions would be short-term. Therefore, the demolition, construction, and infrastructure activities associated with the Proposed Action would not have significant effects on air quality at McChord AFB or on regional or local air quality. **Appendix D** shows an example of how air emissions are calculated. **Section 4.4** discusses project-specific emissions in more detail.

Operational emissions associated with the Proposed Action would not be expected to result in adverse effects on air quality. Day-to-day operations associated with the Proposed Action would generate emissions of criteria pollutants as combustion products from the burning of natural gas by boilers used to provide comfort heating as well as the combustion of fuel oil by emergency generators to produce electrical power, but these emissions would typically be offset by the removal of older and more emissive equipment. In addition, local and regional pollutant effects resulting from direct and indirect emissions from stationary emissions sources under the Proposed Action would result in no new impacts on air quality as the same quantities of hazardous emitting chemical used under the existing procedures would be the same for new facilities and procedures. Any other project for the future out-years that would involve new or additional emissions would be addressed through Federal and state permitting program requirements under New Source Review regulations (40 CFR Parts 51 and 52).

4.3.4 Safety

Short-term, minor direct adverse effects would be expected from the Proposed Action. Implementation of the Proposed Action would slightly increase the short-term risk associated with construction contractors performing work at McChord AFB during the normal workday because the level of such activity would increase. Some of the proposed projects fall within existing QD clear zones and airfield clearance zones. Therefore, contractors would be required to establish and maintain safety programs that are approved by 62 CES/CEV. Projects associated with the Proposed Action would not pose a safety risk to installation personnel or activities at the installation. The proposed construction projects would enable the 62 AW to meet future mission objectives at the installation and conduct or meet mission requirements in a safe operating environment.

4.3.5 Geological Resources

Topography. Long-term, negligible to minor, direct, adverse effects on the natural topography would be expected as a result of demolition, site preparation (i.e., grading, excavating, and recontouring), and

construction under the Proposed Action. The majority of the Proposed Action project sites would occur in areas that were disturbed as a result of past installation activities.

Geology. Long-term, negligible to minor, direct, adverse effects on geological resources resulting from demolition, site preparation (i.e., grading, excavating, and recontouring of the soil), and construction activities would be expected as a result of implementing the Proposed Action. The majority of the Proposed Action project sites would occur in areas that were disturbed as a result of past installation activities.

Soils. Short-term and long-term, negligible to minor, adverse effects on soils could occur as a result of the demolition of old facilities and construction of new facilities under the Proposed Action. Demolition and construction activities would be expected to directly affect the soils as a result of grading, excavation, placement of fill, compaction, mixing, or augmentation necessary to prepare the sites for development. Additional adverse effects could occur as a result of erosion and associated sedimentation during construction, especially in areas where structures were removed during demolition, and vegetative cover was removed during site development. Construction projects would add impervious land mass, which would increase storm water runoff. However, implementation of erosion and sediment control and storm water best management practices (BMPs) both during and after construction, that are consistent with NPDES permit requirements, the installation SWPPP (62 CES/CEV 2003a), and other applicable codes and ordinances would minimize the potential for adverse effects resulting from erosion and transport of sediments in storm water runoff. Projects that disturb less than 1 acre but have a high potential to impact storm water would also require permits and plans. Implementation of BMPs such as diverting flows away from construction and demolition sites, use of silt fences, and covering soil stockpiles along with adherence to permit and plan requirements would minimize the potential for offsite transport of sediment and other pollutants by wind or in storm water runoff.

Because the soils at McChord AFB are not drained or irrigated as appropriate for agriculture, there are no prime farmlands present at McChord AFB. Therefore, no effects on prime farmland would occur as a result of implementing the Proposed Action.

4.3.6 Water Resources

Short-term, negligible to minor, adverse effects on groundwater and surface water could occur as a result of sedimentation and erosion associated with the Proposed Action. Long-term, negligible to minor, adverse effects on groundwater and surface water quality could occur as a result of the increase of 10 acres of impervious surfaces associated with the Proposed Action. Increases in impervious surfaces would change peak flow runoff, divert runoff to storm drains, and reduce natural runoff and infiltration into ground surfaces. Diversion of natural flows would reduce shallow groundwater recharge over time. Proper engineering practices and implementation of erosion and sediment control, and storm water BMPs (such as silt fencing, sediment traps, and covering of soil piles during construction and demolition and use of properly designed storm water detention and retention facilities after construction) would minimize the potential adverse effects of the Proposed Action.

Groundwater. The activities associated with the Proposed Action could have short-term and long-term, negligible to minor, adverse effects on groundwater quality. It is assumed that the increase in impervious surfaces would slightly increase runoff to streams and decrease recharge of the aquifer system. Implementation of storm water and spill prevention BMPs developed consistent with the installation SWPPP and other applicable plans would minimize potential runoff or spill-related effects on groundwater.

Surface Water. Implementation of the Proposed Action could have short-term and long-term, negligible to minor, beneficial and adverse effects on surface water and surface water quality. Proper engineering practices, erosion and sediment control, and storm water BMPs (such as silt fencing, sediment traps, and covering of soil piles) would be implemented both during and after construction, consistent with the NPDES permit requirements, the installation SWPPP and SPCCP, and all applicable Federal, state, and local regulations and policies. These BMPs would minimize runoff-related impacts and the potential for adverse effects on surface water quality. A negligible to minor increase in the conveyance of nonpoint source pollutants in runoff to the tributaries on the installation could occur in association with construction and demolition activities if properly designed BMPs were not implemented and maintained.

Floodplain. In accordance with EO 11988, construction activities in the 100-year floodplain must be avoided. There are no projects under the Proposed Action in the vicinity of the 100-year floodplain at McChord AFB. Any construction activities within the 100-year floodplain at McChord AFB would require approval from HQ AMC and are outside the scope of this IDEA.

4.3.7 Biological Resources

The Proposed Action would result in short-term and long-term, minor, adverse effects on biological resources. McChord AFB has an Integrated Natural Resources Management Plan (INRMP) that contains detailed information about biological resources management. Under the Proposed Action, all projects would be implemented in accordance with the guidelines set forth in the INRMP (62 CES/CEV 2003a).

Vegetation. Short-term and long-term, minor, adverse effects on vegetation could occur as a result of construction associated with the Proposed Action. The majority of projects associated with the Proposed Action would occur in the improved areas of McChord AFB, which would primarily affect landscaped species. The possible removal of trees and native vegetation would result in long-term minor adverse effects on vegetation. In forested areas, construction equipment has the potential to result in damage to vegetation as a result of collision with or mechanical damage to plants (including roots). Following construction, disturbed areas would be landscaped in accordance with McChord AFB standards and the installation INRMP (62 CES/CEV 2003a).

Wildlife. Short-term, minor, adverse effects on wildlife could occur as a result of demolition and construction noise and minor loss of habitat associated with the Proposed Action. The majority of projects associated with the Proposed Action would occur in improved areas of McChord AFB that are not considered valuable wildlife habitat. Birds, mammals, reptiles, amphibians, and insects that occur at the installation might visit these areas, but are likely to spend the majority of their time in the undeveloped portions. Most wildlife species that do occur in these areas are adapted to a suburban and urban environment. Therefore the effects of construction noise and heavy equipment use would be slightly adverse in the short-term. However, wildlife affected by noise would quickly recover once the construction noise ceased.

Long-term, minor, direct and indirect, adverse effects on wildlife could result from vegetation clearing. Effects would result from the direct displacement of species during removal and the indirect reduction of habitat. The reduction of vegetation would be negligible because of the availability of similar habitats in adjacent areas and throughout McChord AFB. Mortality of some less-mobile species could occur as a result of inability to move out of the way of operating equipment

Protected and Sensitive Species. No adverse effects on Federal- or state-listed species would be expected to occur as a result of implementing the Proposed Action. While Federal- or state-listed species have been documented at McChord AFB, these species are not expected to occur at any project site. All projects that would occur near protected and sensitive species or suitable habitat for protected or sensitive

species would be coordinated with WDFW and USFWS, as appropriate. Potential adverse effects on avian species that are passing through McChord AFB, protected under the Migratory Bird Treaty Act, could occur as a result of the Proposed Action. Some installation and development projects under the Proposed Action could result in a reduction in the nesting habitat of some migratory birds. However, no intentional taking of migratory bird or breeding or nesting habitat would occur. These impacts are expected to be negligible because of availability of similar habitats throughout McChord AFB.

Wetlands. In accordance with EO 11990, *Protection of Wetlands*, the USAF must demonstrate that there are no practicable alternatives to construction within wetlands. There are 138.34 acres of wetlands on McChord AFB (see **Figure 2-2**). The USAF avoids military operations in wetlands, where possible.

There are no demolition, construction, or infrastructure projects proposed in wetlands. Construction activities adjacent to wetlands could result in indirect, adverse effects because of erosion and sedimentation. These types of impacts would be minimized using BMPs (as described under **Section 4.3.6**) and would not require mitigation. If a proposed project is relocated into a wetland, then that project would require approval from HQ AMC and additional NEPA analysis. A current jurisdictional wetlands determination would be necessary prior to conducting activities that could affect wetlands or other waters of the United States.

4.3.8 Cultural Resources

Archaeological Resources. McChord AFB has completed archaeological surveys of all undisturbed land areas within the installation boundaries. No evidence for prehistoric period archaeological sites was encountered. Nine historic sites, two historic road segments, and a sheep station have been recorded; of these, four of the historic sites have been evaluated as not eligible for listing in the NRHP. The remaining historic sites and features require further evaluation. None of these unevaluated resources are within portions of the installation that would be impacted by projects associated with implementation of the Proposed Action. Accordingly, the Proposed Action has no potential to impact archaeological resources.

As noted in Section 5.5.1 of the ICRMP (MAFB 2004), if potentially significant archaeological resources are identified during the course of the Proposed Action, the individual responsible for supervising the work will notify the CRM immediately. The CRM will notify the SHPO, as required by 36 CFR 800.11(b) and the Archaeological and Historical Preservation Act (16 U.S.C. Section 469). If human remains are discovered, the CRM will follow the procedures outlined in Section 5.5.2 of the ICRMP.

Architectural Resources. Some projects would occur within the McChord Field Historic District (see **Sections 4.4.2.1**, **4.4.3.2**, and **4.4.4** for more information about those projects). The McChord AFB Architectural Compatibility Guide includes some guidance regarding the treatment of historic properties. The guide presently states that McChord AFB's historic buildings shall be treated in accordance with the Secretary of the Interior's Preservation Guidelines. Few specifications for new construction in the historic district are included, but the guide generally suggests referring to historic guidelines for activities such as roofing, exterior walls, and fenestration. Until design specifications for the Historic District are incorporated into the Architectural Compatibility Guide, each design would be evaluated on a case-by-case basis. All designs are reviewed by the CRM, following the internal review procedures outlined in Section 4.3.1 of the ICRMP (MAFB 2004).

Legislative requirements designed to preserve and protect character defining features of historic properties and avoid deterioration are contained in the *Secretary of the Interior's Standards for Historic Preservation Projects* (36 CFR Part 68). Although these standards were originally promulgated to apply to proposed grant-in-aid projects assisted through the National Historic Preservation Fund, numerous Federal agencies have recognized the usefulness and practicality of the guidance. The USAF uses the

standards as recommended guidance. The USAF publication, "Preserving a Heritage, Standards and Illustrated Guidelines for Rehabilitating Historic Air Force Buildings and Structures," provides additional guidance for McChord AFB. This document describes procedures to identify, maintain, repair, and replace historic materials, features, finishes, and design-compatible additions to historic buildings or new construction within historic districts. This guidance is used on McChord AFB by all parties involved in maintaining, repairing, rehabilitating, or upgrading historic properties.

Resources of Traditional, Religious, or Cultural Significance to Native American Tribes. McChord AFB has initiated consultation with the Nisqually Tribe and the Puyallup Tribe, and representatives of both tribes were provided a description of the Proposed Action and alternatives for review and comment. Per the ICRMP (MAFB 2004), no resources of concern to Native American tribes have been identified within McChord AFB. Tribal leaders have been informed that they may request consultations with McChord AFB at any time. In accordance with NAGPRA and AFI 32-7065, should any unanticipated Native American human remains be encountered on the installation, the CRM will notify the SHPO and the appropriate Native American groups.

4.3.9 Socioeconomic Resources

Socioeconomic Resources. Short-term minor direct beneficial effects would be expected under the Proposed Action. Construction expenditures from the Proposed Action would have a direct, beneficial effect on the local economy. The proposed demolition, construction, and infrastructure projects at McChord AFB would cost approximately $259 million over 5 years. The Gross State Product of Washington in 2006 was approximately $253 billion; therefore the proposed construction, demolition, and infrastructure projects would represent less than 0.1 percent of the Gross State Product per year over 5 years.

The Proposed Action does not involve a change of personnel at McChord AFB, and the proposed construction and demolition activities would be temporary and occur over the next 5 years. Therefore, no permanent or long-term effects on population, personal income, school enrollment, poverty levels, or other demographic or employment indicators in the ROI would be expected.

Environmental Justice. Potential adverse effects from new construction activities would occur on McChord AFB with negligible adverse impacts anticipated off-installation. Construction activities at McChord AFB would be dispersed throughout the installation over the next 5 years. Possible adverse effects from construction such as increased traffic, increased noise levels, and decreased air quality would be minimal and would affect ROI and on-installation residents equally. Therefore, no disproportionate impacts on minority or low-income populations from the Proposed Action were identified.

4.3.10 Infrastructure

The Proposed Action could result in minor long-term adverse effects by increasing demand on the installation's infrastructure and utilities. Long-term beneficial effects would be realized from improved infrastructure and communication systems. Most routine infrastructure improvements are categorically excluded from detailed analysis under Appendix B to 32 CFR Part 989 (i.e., A2.3.8, A2.3.9, A2.3.10, A2.3.11, A2.3.12, A2.3.13, or A2.3.14), unless a particular project is unusually large or traverses a sensitive area of the installation. Infrastructure projects that would normally be categorically excluded from analysis in an EA or EIS are not included in this IDEA (see **Appendix A** for a complete list of projects that are analyzed in this IDEA).

Airfield. Long-term beneficial effects on the airfield would be expected from the Proposed Action. As discussed in **Section 3.10**, McChord AFB proposes several airfield pavement system and lighting

upgrades and drainage repairs. Infrastructure upgrades would bring McChord AFB airfields into compliance with USAF and AMC standards. Programmed projects include installation of drainage systems, pavement improvements, lighting upgrades, manholes, underground utility lines, and fire safety upgrades.

Transportation. Increased traffic associated with construction vehicles would be expected to have a short-term minor adverse effect on the transportation network in and around McChord AFB and on the South Gate and Main Gate. The construction and demolition phase of projects under the Proposed Action at McChord AFB would require delivery of materials to and removal of debris from construction sites. Construction traffic would compose a small percentage of the total existing traffic and many of the vehicles would be driven to and kept on-site for the duration of construction and demolition, resulting in relatively few additional trips. McChord AFB prepared an *Environmental Assessment of Anti-Terrorism/Force Protection at Base Motor Vehicle Traffic Gates at McChord Air Force Washington* (MAFB 2003) analyzing the traffic impacts of relocating incoming construction traffic from the North Gate to the South Gate. As indicated in that analysis, construction contractors using heavy commercial vehicles would be encouraged to approach the South Gate from the east (using Pacific Avenue), reducing adverse traffic effects on residential areas on 150th Street (MAFB 2003). Furthermore, commercial vehicles would primarily enter McChord AFB during off-peak hours, reducing additional congestion of roads surrounding McChord AFB. Exiting commercial traffic would use the Main Gate. The proposed installation development activities would occur at different times and locations on McChord AFB, which would further reduce on-base traffic congestion from construction. Any potential increases in traffic volume associated with proposed demolition and construction activity would be temporary.

No long-term adverse effects would be expected on the transportation network at McChord AFB, which is maintained by proactive repair and replacement projects. The Proposed Action would provide additional parking, repair pavements, and widen some roadways on McChord AFB.

Electrical. Long-term beneficial effects on electrical systems would be expected from the Proposed Action. Upgrading the electrical feeder lines and other electrical distribution would have a beneficial impact on the installation's load capacities. In addition, replacing some of the aboveground lines with underground distribution would provide the installation with a more secure electrical system.

Natural Gas. No adverse effects on natural gas systems would be expected from the Proposed Action. McChord AFB continually increases infrastructure as needed. As discussed in **Section 3.10**, much of the natural gas system is generally good.

Heating, Ventilation, and Air Conditioning. Long-term beneficial effects would be expected. McChord AFB continually upgrades infrastructure as needed. As indicated in **Section 3.10**, many of the older lines and boiler are degraded, so upgrades would be beneficial to the installation.

Liquid Fuel. Long-term beneficial effects would be expected. The Proposed Action at McChord AFB would include replacing bulk fuel storage and distribution components and constructing additional POL facilities and other projects as needed. These planned improvements along with the existing system would continue to be adequate to meet the mission needs of 62 AW.

Water Supply. Minor beneficial effects on the potable water and firefighting systems would be expected at McChord AFB. McChord AFB continually implements projects to improve the water supply system on the installation. As discussed in **Section 3.10**, the water supply system was rated as in generally good condition. However the potable water was rated as inadequate because of chlorine contact time, sediments, and capacity issues. The Proposed Action would help provide more reliable water supply and storage at McChord AFB. In addition, upgrading and replacing water lines and increasing storage

capacity on the installation would provide a beneficial impact on the installation and enhance potable drinking standards.

Sanitary Sewer and Wastewater Systems. No adverse effects on sanitary sewer systems would be expected from the Proposed Action. The sanitary sewer system was determined to be adequate (see **Section 3.10**). McChord AFB continually upgrades lift stations and replaces sewer lines that are in poor condition as needed. Upgrading out-of-date sewer and waste water lines on the installation would provide a beneficial impact on the installation.

Storm Water Systems. No adverse effects on storm water systems would be expected from the Proposed Action. The sanitary sewer system was determined to be adequate (see **Section 3.10**). McChord AFB continually upgrades and replaces storm drainage that is in poor condition as needed. The lack of programmed improvements and no reports of flooding, erosion, or mission impact indicate the system is not hindering mission capability.

Communications. No adverse effects on communications systems would be expected from the Proposed Action. McChord AFB continually upgrades the installation's communications system as needed. Services and infrastructure are available to support a wide range of communications requirements and are capable of supporting future development. Upgrading out-of-date communication lines on the installation would provide a beneficial impact on the installation and enhance mission operations.

Solid Waste Management. Direct short-term minor adverse effects would result from increased construction and demolition waste production during construction. Solid waste generated from the proposed construction and demolition activities would consist of building materials such as solid pieces of concrete, metals (conduit, piping, and wiring), and lumber. Contractors would be required to recycle construction and demolition to the greatest extent possible as part of installation policy, and any recycled construction and demolition waste would be diverted from landfills. Construction and demolition waste would be sent to an approved local landfill. As described in **Section 2.1**, construction and demolition activities would occur over an estimated 5-year timeframe.

Pollution Prevention. It is anticipated that the Proposed Action would not affect the Pollution Prevention Program at McChord AFB. Quantities of hazardous material and chemical purchases, off-installation transport of hazardous waste, disposal of solid waste, and energy consumption would continue. Operation of new facilities under the Proposed Action would require procurement of products containing hazardous materials, generation of hazardous waste, and consumption of energy consistent with the existing conditions.

4.3.11 Hazardous Materials and Wastes

The Proposed Action would not result in long-term adverse effects on hazardous materials use or hazardous waste generation. Short-term, minor, adverse effects resulting from use of hazardous materials during construction, such as sealants and solvents, would be minimal.

New facilities and procedures for the fuels storage facility would result in increased quantities of hazardous materials. Procedures would remain the same for the quantities of chemicals (i.e., paints, solvents, and fuels) used under the existing procedures. These proposed projects would conform to existing management plans.

Hazardous Materials. Short-term, minor, adverse effects on hazardous materials could be expected. Products containing hazardous materials, such as sealant and solvents, would be procured and used during the proposed construction and demolition. It is anticipated that the quantity of products containing

hazardous materials would be minimal and their use would be of short duration. Contractors would be responsible for the management of hazardous materials, which would be handled in accordance with Federal, state, and USAF regulations. The increase in hazardous materials would not affect overall management plans or capacities for handling these materials.

Hazardous Wastes. Short-term, minor, adverse effects from hazardous wastes would be expected. Hazardous wastes generated during construction and demolition activities would be minor. Contractors would be required to confer with the 62 CES/CEV regarding their hazardous wastes for proper disposal. Contractors would also be required to follow the McChord AFB *Hazardous Waste Management Plan*. Waste produced would not be expected to affect the management plans or capacities for handling this waste.

Asbestos-Containing Materials and Lead-Based Paint. Long-term, minor, beneficial effects on ACM and LBP could occur. Specifications for proposed construction activities (as discussed in **Section 3.11**) and USAF regulations prohibit the use of ACM and LBP for new construction. Buildings scheduled for demolition could contain ACM and LBP, and, therefore, would need to be surveyed by the construction contractor prior to demolition activities. Removal of suspect ACM would lessen the chance of friability and therefore lessen the potential exposure to people. McChord AFB keeps records on ACM and LBP maintenance and abatement. Sampling and abatement of ACM or LBP would occur prior to demolition activities and would be handled in accordance with the McChord AFB AMP and Lead-Based Paint Management Plan and USAF policy, thereby mitigating any adverse effects. The removal of any ACM and LBP would result in long-term beneficial effects by reducing the quantities of these materials that must be managed and possible future exposure.

Radon. No adverse effects due to radon would be expected. Because previous radon surveys revealed high concentration levels of radon, radon concentrations should be measured periodically, particularly in enclosed or subsurface spaces, such as basements, to determine whether any mitigation is required. As recommended by the McChord AFB General Plan, new construction should take into account the possibility of radon being present in lower floors or basement areas (62 AW 2005a). Proper ventilation in enclosed spaces would mitigate any adverse effects.

PCBs. Long-term, minor, beneficial effects on PCBs would be expected. Any PCB-containing capacitors, transformers and fluorescent light ballasts would be removed and properly disposed prior to demolition or replacement. Removal of the PCB-containing equipment would be a long-term, beneficial effect. Procedures for handling these items are found in 62 CESI 32-11, *Handling, Storage, Transport, and Disposal of PCBs*. Additionally, no new sources of PCBs would be introduced on the installation from any of the proposed activities.

Environmental Restoration Program. No adverse effects from or on ERP sites would occur. Avoidance of these areas would be practiced during the siting of proposed projects. If it is determined that avoiding an ERP site is not feasible, approval would be required by the 62 CES/CEV prior to any demolition, construction, or infrastructure projects. There is a potential for workers to encounter contamination from ERP sites during construction. Therefore, it is recommended that a health and safety plan be prepared in accordance with OSHA requirements prior to commencement of construction activities. Workers performing soil removal activities within ERP sites are required to have OSHA 40-hour Hazardous Waste Operations and Emergency Response (HAZWOPER) training. In addition to this training, supervisors are required to have an OSHA Site Supervisor certification. Should contamination be encountered, handling, storage, and disposal activities would be conducted in accordance with applicable Federal, state, and local regulations; AFIs; and McChord AFB programs and procedures.

4.4 Detailed Environmental Consequences of the Proposed Action

This section presents the potential environmental consequences that could occur as a result of the Proposed Action. **Sections 4.4.1**, **4.4.2**, and **4.4.3** analyze in detail those projects identified in **Section 2** as representative of potential environmental consequences because of size or other sensitive aspects of these projects.

4.4.1 Representative Demolition Projects

4.4.1.1 D1. Demolish Existing Base Engineering Facilities

The majority of the base engineering facilities are substandard for their current uses. Most are more than 60 years old and are not economical to upgrade. These buildings, which consist of wood frame and masonry structures, are highly inefficient in energy conservation and space utilization. The configuration of many of the buildings is poorly suited for maintenance or supply operations, which are their current uses. **Table 4-2** summarizes the structures proposed for demolition under Project D1. In addition, approximately 211,700 ft^2 of open storage and various pavements would be removed under Project D1. Demolition of these facilities and pavements would create approximately 255,460 ft^2 of open space for future development opportunities. Several buildings in this area of the installation (Buildings 301, 556, 594, 534, 531, and 528) would be retained for future use. As shown in **Figure 4-1**, there are no sensitive areas or resources in this project area.

Table 4-2. Buildings Proposed for Demolition under Project D1

Building No.	Current Use	Year Constructed	Size
529	Latrine	unknown	380 ft^2
533	Storage Shed	1952	1,360 ft^2
535	Covered Storage	1942	1,590 ft^2
536	Maintenance Shop and Covered Storage	1942	10,200 ft^2
537	Storage Shed	1944	5,150 ft^2
538	Storage Shed	1984	80 ft^2
540	Maintenance Shop	1952	14,700 ft^2
541	Covered Storage	1952	7,290 ft^2
561	Storage Shed	1986	600 ft^2
562	Storage Shed	1986	1,210 ft^2
563	Storage Shed	1986	600 ft^2
24011	Vehicle Services Rack	1975	600 ft^2
Total Area of Buildings Demolished			**43,760 ft^2**

Source: Department of Defense Form 1391 for Project PQWY 92-30011, September 2005

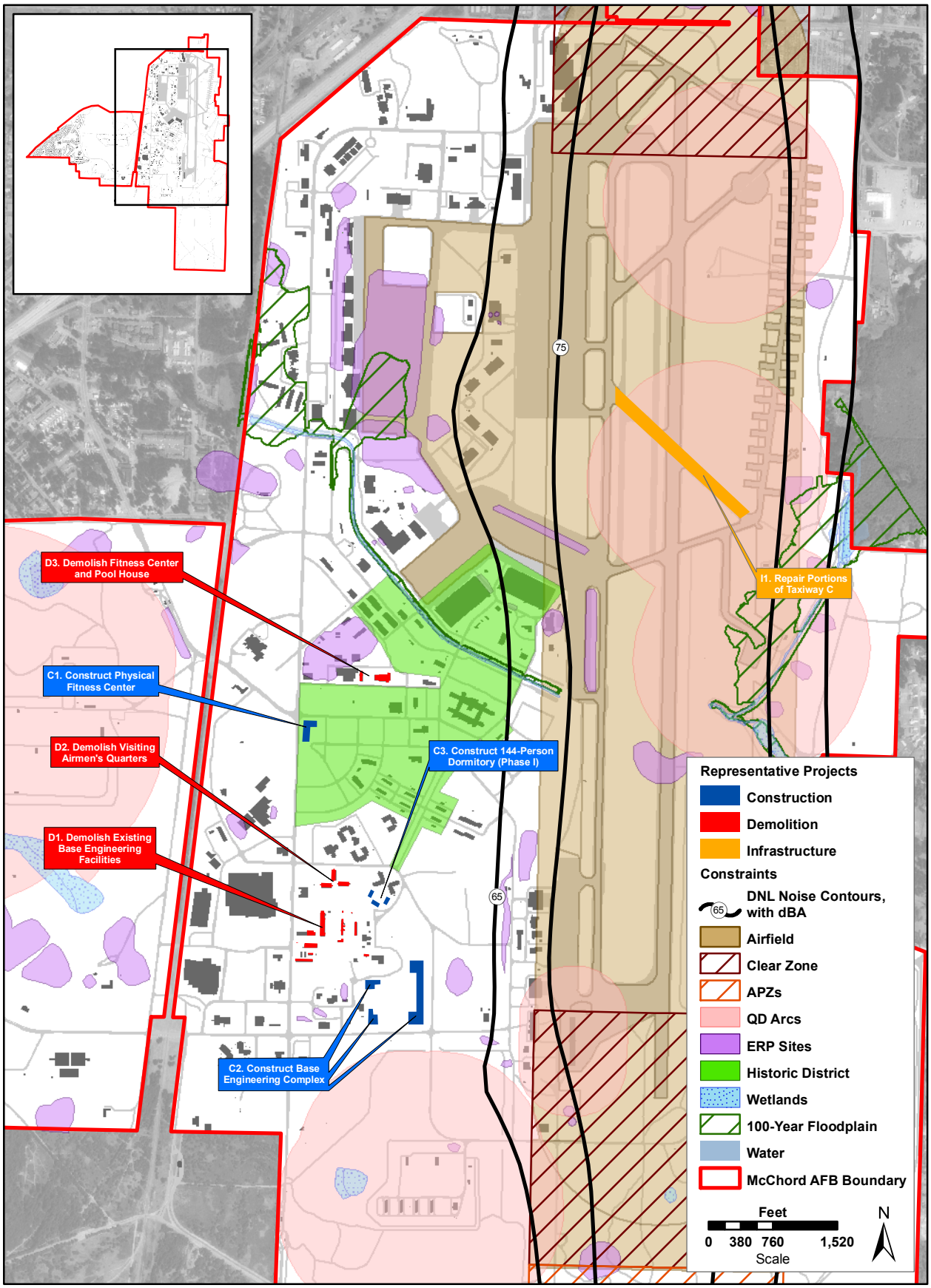


Figure 4-1. Proposed Representative Projects D1, D2, D3, C1, C2, C3, and I1 Relative to Known Constraints

Noise. Short-term intermittent adverse effects on noise levels would be expected as a result of the demolition of the existing base engineering facilities and associated pavements. The noise emanating from the proposed demolition of these buildings would be localized, short-term, and intermittent during construction operations. **Table 3-1** shows the predicted noise levels for various pieces of construction equipment operating at 50 feet from the source. Heavy construction equipment would be operational periodically during the demolition, which would limit the duration of increased noise levels. The demolition of these buildings would be expected to result in noise levels comparable to those indicated in **Table 4-3**. This area of McChord AFB is in the Industrial land use area; however, Administrative and Community uses are adjacent to the site. USAF personnel that are approximately 150 feet from the source of the construction site would experience noise levels of approximately 80 dBA as a result of the demolition.

Table 4-3. Expected Noise Levels Resulting from Demolition

dBA at 50 feet	dBA at 300 feet	dBA at 500 feet	dBA at 1,000 feet	dBA at 3,000 feet
90	74	70	64	54

Land Use. Long-term beneficial effects would be expected from demolition of the existing base engineering facilities. Demolition activities would have beneficial effects on the installation's organizational functions by removing old, outdated facilities and creating space for future projects. The construction of new facilities where land has been made available by demolition reduces the amount of undisturbed land required for future development. The demolition of these facilities, which is currently within the Industrial land use area, would make land available for the construction of new facilities. Present and future land uses would be compatible and no changes in land use functions would be expected.

Air Quality. Short-term minor adverse effects would be expected as a result of the demolition of the existing base engineering facilities. Demolition activities would result in air emissions from the operation of heavy machinery. Fugitive particulate matter would be minimized by continually spraying water over the demolition area. Demolition of these facilities would be expected to result in air emissions comparable to those indicated in **Table 4-4**.

Table 4-4. Expected Criteria Pollutant Emissions Resulting from Demolition of Base Engineering Facilities

Proposed Project	Project Size (ft^2)	NO_x (tpy)	VOC (tpy)	CO (tpy)	SO_x (tpy)	PM (tpy)
D1. Demolish Base Engineering Facilities	255,500	2.544	0.436	3.707	0.051	7.192
Conformity *de minimis* threshold		NA	NA	100	NA	NA
Regional PSIACQR Emissions Inventory		121,986	128,696	1,042,661	8,938	46,166
Project percentage of Regional Emissions Inventory (PSIAQCR)		0.0019%	0.0003%	0.0003%	0.0004%	0.0145%

Note: NA = not applicable

McChord AFB is classified as a maintenance area for CO, so the General Conformity Rule applies to the Proposed Action. Demolishing the base engineering facilities would not exceed *de minimis* threshold levels. In addition, the criteria pollutants generated by the demolition of these facilities would not exceed 10 percent of the regional emissions values.

Safety. Short-term minor adverse effects would be expected from the demolition of base engineering facilities as a result of the risks associated with demolition-type activities. No long-term effects would be expected. Although all contractors are required to follow and implement OSHA standards to establish and maintain safety procedures, there would be an increased risk of accidents with increased demolition activities. All the buildings proposed for demolition (refer to **Table 4-2**) were built prior to 1990. Therefore, it is likely that construction workers could encounter ACM or LBP contamination. As-built drawings and building materials plans should be reviewed prior to demolition to ensure no ACM were used. ACM and LBP hazards are discussed in more detail in the subsection addressing Hazardous Materials and Wastes. Abatement of ACM or LBP materials would be performed by persons who are properly trained in the handling and disposal of these materials. All demolition activities would be performed in accordance with Federal, state, and local regulations to minimize hazards associated with hazardous materials, wastes, and substances.

Geological Resources. Short-term, minor, adverse effects could occur from grading, excavating, and grooming of the soil. Approximately 255,460 ft^2 (5.9 acres) of soil would be disturbed. Soils in the vicinity of the engineering facilities have been heavily disturbed by previous activities. The proposed demolition would require a NPDES construction storm water permit. The development of a site-specific SWPPP with BMPs and erosion-control techniques (such as silt fencing, sediment traps, and the covering of soil piles) to manage runoff and erosion during and after demolition would be required. Therefore, effects on soils would be minimized. Disturbed areas would be replanted with native vegetation, as necessary. The proposed demolition project would also comply with the installation's SWPPP (62 CES/CEV 2005); SPCCP (62 CES/CEV 2006a); INRMP (62 CES/CEV 2003a); and all applicable Federal, state, and local regulations and policies.

Water Resources. The demolition of the existing base engineering facilities could result in short-term, minor, adverse effects on water resources as a result of erosion and sedimentation associated with ground-disturbing activities. The proposed demolition would require a NPDES construction permit. The development of a site-specific SWPPP with BMPs and erosion-control techniques (such as silt fencing, sediment traps, and the covering of soil piles) to manage runoff and erosion during and after demolition would be required. Therefore, effects on water resources would be minimized. The proposed demolition project would also comply with the installation's SWPPP (62 CES/CEV 2005); SPCCP (62 CES/CEV 2006a); and all applicable Federal, state, and local regulations and policies.

The demolition of these facilities (Buildings 529, 533, 535, 536, 537, 538, 540, 541, 561, 562, 563, and 24011) (43,760 ft^2) and pavements (211,700 ft^2) has the potential to result in long-term beneficial effects on water resources associated with a decrease in impervious surface of approximately 255,500 ft^2 (5.9 acres). This decrease would result in a reduction in the velocity and volume of storm water.

Biological Resources. No adverse effects on biological resources would occur as a result of demolition of the existing base engineering facilities, which are in a heavily disturbed area. There is minimal existing vegetation, no suitable habitat for wildlife, and no wetlands. No Federal- or state-protected species are expected to occur in this area of McChord AFB. McChord AFB is committed to managing biological resources in accordance with the installation's INRMP (62 CES/CEV 2003a) and all applicable Federal, state, and local regulations and policies.

Cultural Resources. The Proposed Action has no potential to impact archaeological resources (see **Section 4.3.8**). Of the buildings proposed for demolition under Project D1, six have been evaluated as not eligible for listing in the NRHP. The remaining buildings are substantially less than 50 years old and have no Cold War associations that would make them eligible for listing in the NRHP under Criterion Consideration G. Project D1, therefore, has no potential to impact architectural resources. No resources of significance to Native American tribes have been identified within McChord AFB to date. As part of its ongoing consultation program, however, McChord AFB will determine the potential of the Proposed Action to impact resources of traditional, religious, or cultural significance to Native American tribes in consultation with interested tribes.

Socioeconomic Resources and Environmental Justice. Negligible effects on socioeconomic resources would be expected from the proposed demolition of base engineering facilities and pavements. Proposed demolition costs would be approximately $1 million, and demolition activities would provide only temporary employment for contractors in the area. Demolition would occur entirely on McChord AFB and have little potential to affect off-installation residents adversely.

Infrastructure. Negligible effects on infrastructure resources would be expected from the demolition of the base engineering facilities. Removal of these facilities would result in less demand for certain utilities, but this reduction would be negligible when compared with total installation usage. Short-term adverse effects would be expected as a result of the generation of approximately 19,801 tons of demolition debris (USEPA 1998). This is a short-term adverse effect in that debris would only be generated during the demolition activities; however, debris that is not recycled would be landfilled, which would be considered a long-term irreversible adverse effect.

Hazardous Materials and Wastes. No long-term effects on hazardous materials management or hazardous waste generation would be expected as a result of the proposed demolition of these buildings. The implementation of operations and management plans for these materials and wastes would reduce the potential for adverse effects. Due to construction dates, surveys and records for abatement or remediation for ACM and LBP at Buildings 533, 535, 536, 537, 540, and 541 should be consulted prior to demolition. If incomplete or no records exist, these buildings should be assumed to contain both ACM and LBP. Sampling for ACM and LBP would occur prior to any demolition activities so that these materials can be properly characterized, handled, and disposed of in accordance with the AMP, LBP Management Plan, and USAF policy. Similarly, records for these buildings for PCB should be consulted to determine what, if any, PCBs have been removed. The demolition of these buildings would not affect or be affected by ERP sites. If any other hazardous materials such as cleaning solvents or fuels were stored at these buildings, they would be removed. Air conditioners, refrigerators, or other appliances using Freon, a known ozone-depleting substance, would be identified and disposed of properly.

4.4.1.2 D2. Demolish Visiting Airmen's Quarters

Buildings 595, 596, and 597 are currently used as Visiting Airmen's Quarters, with each building housing 36 people. These three buildings are substandard for their use. **Table 4-5** summarizes the structures proposed for demolition under Project D2. As shown in **Figure 4-1**, there are no sensitive areas or resources in this project area.

The demolition of these facilities would make previously disturbed land available for dormitory construction (Phase II and III) in the future; this construction is not considered as a component of Project D2 but is analyzed as Projects C5 and C6 in **Section 4.4.4**.

Table 4-5. Buildings Proposed for Demolition under Project D2

Building No.	Current Use	Year Constructed	Size
595	Visiting Airmen's Quarters	1976	10,720 ft^2
596	Visiting Airmen's Quarters	1976	10,720 ft^2
597	Visiting Airmen's Quarters	1976	10,720 ft^2
Total Area of Buildings Demolished			**32,160 ft^2**

Sources: Department of Defense Form 1391 for Project PQWY 08-3001, September 2005 and Automated Civil Engineer System Form 7115 for PQWY, June 7, 2007

Noise. Short-term minor intermittent adverse effects on noise levels would be expected as a result of the demolition of these three buildings. The noise emanating from the proposed demolition would be localized, short-term, and intermittent during construction operations. **Table 3-1** shows the predicted noise levels for various pieces of construction equipment operating at 50 feet from the source. Heavy construction equipment would be operational periodically during the demolition, which would limit the duration of increased noise levels. The proposed construction site is in the Housing Unaccompanied land use area. Buildings 525 and 548 are approximately 150 feet from the construction site. Building 525 is in the Administrative land use area, and Building 548 is in the Housing Unaccompanied land use area. USAF personnel that are approximately 150 feet from the source of the construction site would experience noise levels of approximately 80 dBA as a result of the demolition.

Land Use. Long-term beneficial effects would be expected from demolition of Buildings 595, 596, and 597. Demolition activities would have beneficial effects on the installation's organizational functions by removing old, outdated facilities and creating space for future projects. The construction of new facilities where land has been made available by demolition reduces the amount of undisturbed land required for future development. The demolition of these facilities, which are currently within the Housing Unaccompanied land use area, would make land available for the construction of new facilities in the future. Present and future land uses would be compatible and no changes in land use functions would be expected.

Air Quality. Short-term minor adverse effects would be expected as a result of the demolition of the Visiting Airmen's Quarters. Demolition activities would result in air emissions from the operation of heavy machinery. Fugitive particulate matter would be minimized by continually spraying water over the demolition area. Demolition of these facilities would be expected to result in air emissions comparable to those indicated in **Table 4-6**.

McChord AFB is classified as a maintenance area for CO, so the General Conformity Rule applies to the Proposed Action. Demolishing the Visiting Airmen's Quarters would not exceed *de minimis* threshold levels. In addition, the criteria pollutants generated by the demolition of these facilities would not exceed 10 percent of the regional emissions values.

Table 4-6. Expected Criteria Pollutant Emissions Resulting from Demolition of Visiting Airmen's Quarters

Proposed Project	Project Size (ft^2)	NO_x (tpy)	VOC (tpy)	CO (tpy)	SO_x (tpy)	PM (tpy)
D2. Demolish Visiting Airmen's Quarters	32,160	0.041	0.007	0.060	0.001	0.897
Conformity *de minimis* threshold		NA	NA	100	NA	NA
Regional PSIACQR Emissions Inventory		121,986	128,696	1,042,661	8,938	46,166
Project percentage of Regional Emissions Inventory (PSIAQCR)		0.00003%	0.00001%	0.00001%	0.00001%	0.0018%

Note: NA = not applicable

Safety. Short-term minor adverse effects would be expected from the demolition of the Visiting Airmen's Quarters as a result of the risks associated with demolition-type activities. No long-term effects would be expected. Although all contractors are required to follow and implement OSHA standards to establish and maintain safety procedures, there would be an increased risk of accidents with increased demolition activities. All the buildings proposed for demolition (refer to **Table 4-5**) were built prior to 1990. Therefore, it is likely that construction workers could encounter ACM or LBP contamination. As-built drawings and building materials plans should be reviewed prior to demolition to ensure no ACM were used. ACM and LBP hazards are discussed in more detail in the subsection addressing Hazardous Materials and Wastes. Abatement of ACM or LBP would be performed by persons who are properly trained in the handling and disposal of these materials. All demolition activities would be performed in accordance with Federal, state, and local regulations to minimize hazards associated with hazardous materials, wastes, and substances.

Geological Resources. Short-term, negligible, adverse effects could occur from grading, excavating, and grooming of the soil. Approximately 32,160 ft^2 (0.74 acres) of soil would be disturbed. Soils in the vicinity of the Visiting Airmen's Quarters have been heavily disturbed by previous activities. BMPs and erosion-control techniques (such as silt fencing, sediment traps, and covering of soil piles) to manage runoff and erosion during and after demolition would be required. Therefore, effects on soils would be minimized. Disturbed areas would be replanted with native vegetation, as necessary. The proposed demolition project would also comply with the installation's SWPPP (62 CES/CEV 2005); SPCCP (62 CES/CEV 2006a); INRMP (62 CES/CEV 2003a); and all applicable Federal, state, and local regulations and policies.

Water Resources. The demolition of the Visiting Airmen's Quarters could result in short-term, negligible, adverse effects as a result of erosion and sedimentation associated with ground-disturbing activities. BMPs and erosion-control techniques (such as silt fencing, sediment traps, and covering of soil piles) to manage runoff and erosion during and after demolition would be required. Therefore, effects on water resources would be minimized. The proposed demolition project would also comply with the installation's SWPPP (62 CES/CEV 2005); SPCCP (62 CES/CEV 2006a); and all applicable Federal, state, and local regulations and policies.

The demolition of the three facilities (Buildings 595, 596, and 597) has the potential to result in long-term beneficial effects on water resources associated with a decrease in impervious surface. The demolition would result in a decrease of approximately 16,200 ft^2 (0.37 acres) of impervious surface. This would

result in an increase in natural infiltration of storm water and a reduction in the volume and velocity of runoff associated with impervious surfaces.

Biological Resources. No adverse effects on biological resources would occur as a result of demolition of the Visiting Airmen's Quarters, which are in a heavily disturbed area. There is minimal existing vegetation, no suitable habitat for wildlife, and no wetlands. No Federal- or state-protected species are expected to occur in this area of McChord AFB. McChord AFB is committed to managing biological resources in accordance with the installation's INRMP (62 CES/CEV 2003a) and all applicable Federal, state, and local regulations and policies.

Cultural Resources. The Proposed Action has no potential to impact archaeological resources (see **Section 4.3.8**). The buildings to be demolished under Project D2 are all less than 50 years in age and, as unaccompanied personnel housing (Visiting Airmen's Quarters), mitigation for their demolition has already been completed as part of the Department of Defense Program Comment for Unaccompanied Personnel Housing implemented in May 2007. Project D2, therefore, has no potential to impact architectural resources. No resources of significance to Native American tribes have been identified within McChord AFB to date. As part of its ongoing consultation program, however, McChord AFB will determine the potential of the Proposed Action to impact resources of traditional, religious, or cultural significance to Native American tribes in consultation with interested tribes.

Socioeconomic Resources and Environmental Justice. Negligible effects on socioeconomic resources would be expected from the proposed demolition of the Visiting Airmen's Quarters. The demolition activities would provide temporary employment for contractors in the area and would cost approximately $500,000. Demolition would occur entirely on McChord AFB and have little potential to affect off-installation residents.

Infrastructure. Negligible effects on infrastructure resources would be expected from the demolition of the Visiting Airmen's Quarters. Removal of these facilities would result in less demand for certain utilities, but this reduction would be negligible when compared with total installation usage. Short-term adverse effects would be expected as a result of the generation of approximately 2,492 tons of demolition debris (USEPA 1998). This is a short-term adverse effect in that debris would only be generated during the demolition activities; however, debris that is not recycled would be landfilled, which would be considered a long-term irreversible adverse effect.

Hazardous Materials and Wastes. No long-term effects on hazardous materials management or hazardous waste generation would be expected as a result of the proposed demolition of these buildings. The implementation of operations and management plans for these materials and wastes would reduce the potential for adverse effects. Due to construction dates, surveys and records for abatement or remediation for ACM and LBP at Buildings 595, 596, and 597 should be consulted prior to demolition. If incomplete or no records exist, these buildings should be assumed to contain both ACM and LBP. Sampling for ACM and LBP would occur prior to any demolition activities so that these materials can be properly characterized, handled, and disposed of in accordance with the AMP, LBP Management Plan, and USAF policy. Similarly, records for these buildings for PCB should be consulted to determine what, if any, PCBs have been removed. The demolition of these buildings would not affect or be affected by ERP sites. If any other hazardous materials such as cleaning solvents or fuels were stored at these buildings, they would be removed. Air conditioners, refrigerators, or other appliances using Freon, a known ozone-depleting substance, would be identified and disposed of properly.

4.4.1.3 D3. Demolish Health and Wellness Center, Outdoor Pool, and Bath House

Building 726, the Health and Wellness Center, is a World War II-era facility with poorly functioning heating and cooling systems, poor handicapped access, inadequate acoustic treatment, and poor layout. Building 736 is a bath house for Facility 81201, an outdoor pool. The outdoor pool is only usable for 25 percent of the year because of the typical inclement weather in Washington. **Table 4-7** summarizes the structures proposed for demolition under Project D3. Demolition of these facilities would create 25,200 ft^2 of open space for future development opportunities. As shown in **Figure 4-1**, there are no sensitive areas or resources in this project area.

Table 4-7. Buildings Proposed for Demolition under Project D3

Building No.	Current Use	Year Constructed	Size
726	Health and Wellness Center	1943	15,200 ft^2
736	Bath House	1980	3,960 ft^2
81201	Outdoor Pool	1991	5,980 ft^2
Total Area of Buildings Demolished			**25,140 ft^2**

Source: Department of Defense Form 1391 for Project PQWY 95-30021, September 2005

McChord AFB proposes to replace its inadequate fitness facilities and provide an indoor pool, which is described in more detail in **Section 4.4.2.1**; the construction of a new fitness complex would eliminate the need for the outdoor pool and bath house. The construction of a new fitness complex is analyzed in detail as Project C1 and not included as a component of Project D3.

Noise. Short-term minor intermittent adverse effects on noise levels would be expected as a result of the demolition of the Health and Wellness Center, outdoor pool, and bath house. The noise emanating from the proposed demolition of these facilities would be localized, short-term, and intermittent during construction operations. Heavy construction equipment would be operational periodically during the demolition, which would limit the duration of increased noise levels. The proposed construction site is in the Community Commercial land use area and adjacent to the historic district. Personnel that are approximately 50 feet from the source of the construction site would experience noise levels of approximately 90 dBA as a result of the demolition.

Land Use. Long-term beneficial effects would be expected from demolition of the Health and Wellness Center, outdoor pool, and bath house. Demolition activities would have beneficial effects on the installation's organizational functions by removing old, outdated facilities and creating space for future projects. The construction of new facilities where land has been made available by demolition reduces the amount of undisturbed land required for future development. The demolition of these facilities, which is currently within the Community Commercial land use area, would make land available for the construction of new community facilities in the future. Present and future land uses would be compatible and no changes in land use functions would be expected.

Air Quality. Short-term minor adverse effects would be expected as a result of the demolition of the Health and Wellness Center, outdoor pool, and bath house. Demolition activities would result in air emissions from the operation of heavy machinery. Fugitive particulate matter would be minimized by continually spraying water over the demolition area. Demolition of these facilities would be expected to result in air emissions comparable to those indicated in **Table 4-8**.

Table 4-8. Expected Criteria Pollutant Emissions Resulting from Demolition of Health and Wellness Center, Outdoor Pool, and Bath House

Proposed Project	Project Size (ft^2)	NO_x (tpy)	VOC (tpy)	CO (tpy)	SO_x (tpy)	PM (tpy)
D3. Demolish Health and Wellness Center, Outdoor Pool, and Bath House	25,200	0.026	0.004	0.037	0.001	0.703
Conformity *de minimis* threshold		NA	NA	100	NA	NA
Regional PSIACQR Emissions Inventory		121,986	128,696	1,042,661	8,938	46,166
Project percentage of Regional Emissions Inventory (PSIAQCR)		0.00002%	0.000003%	0.000003%	0.000004%	0.0014%

Note: NA = not applicable

McChord AFB is classified as a maintenance area for CO, so the General Conformity Rule applies to the Proposed Action. Demolishing the Health and Wellness Center, outdoor pool, and bath house would not exceed *de minimis* threshold levels. In addition, the criteria pollutants generated by the demolition of these facilities would not exceed 10 percent of the regional emissions values.

Safety. Short-term minor adverse effects would be expected from the demolition of the Health and Wellness Center, outdoor pool, and bath house as a result of the risks associated with demolition-type activities. No long-term effects would be expected. Although all contractors are required to follow and implement OSHA standards to establish and maintain safety procedures, there would be an increased risk of accidents with increased demolition activities. Most of the buildings proposed for demolition (refer to **Table 4-7**) were built prior to 1990 and the outdoor pool was constructed in 1991. Therefore, it is likely that construction workers could encounter ACM or LBP contamination. As-built drawings and building materials plans should be reviewed prior to demolition to ensure no ACM were used. ACM and LBP hazards are discussed in more detail in the subsection addressing Hazardous Materials and Wastes. Abatement of ACM or LBP materials would be performed by persons who are properly trained in the handling and disposal of these materials. All demolition activities would be performed in accordance with Federal, state, and local regulations to minimize hazards associated with hazardous materials, wastes, and substances.

Geological Resources. Short-term, negligible, adverse effects could occur from grading, excavating, and grooming of the soil. Approximately 25,140 ft^2 (0.58 acres) of soil would be disturbed. Soils in the vicinity of the Health and Wellness Center have been heavily disturbed by previous activities. BMPs and erosion-control techniques (such as silt fencing, sediment traps, and covering of soil piles) to manage runoff and erosion during and after demolition would be required. Therefore, effects on soils would be minimized. Disturbed areas would be replanted with native vegetation, as necessary. The proposed demolition project would also comply with the installation's SWPPP (62 CES/CEV 2005); SPCCP (62 CES/CEV 2006a); INRMP (62 CES/CEV 2003a); and all applicable Federal, state, and local regulations and policies.

Water Resources. The demolition of the Health and Wellness Center, outdoor pool, and bath house could result in short-term, negligible, adverse effects as a result of erosion and sedimentation associated with ground-disturbing activities. BMPs and erosion-control techniques (such as silt fencing, sediment traps,

and covering of soil piles) to manage runoff and erosion during and after demolition would be required. Therefore, effects on water resources would be minimized. The proposed demolition project would also comply with the installation's SWPPP (62 CES/CEV 2005); SPCCP (62 CES/CEV 2006a); and all applicable Federal, state, and local regulations and policies.

The demolition of the three facilities (Buildings 726 and 736, and Facility 81201) has the potential to result in long-term beneficial effects on water resources associated with a decrease in impervious surface. The demolition would result in a decrease of approximately 25,200 ft^2 (0.58 acres) of impervious surface. This would result in an increase in natural infiltration of storm water and a reduction in the volume and velocity of runoff associated with impervious surfaces.

Biological Resources. No adverse effects on biological resources would occur as a result of demolition of the Visiting Airmen's Quarters, which are in a heavily disturbed area. There is minimal existing vegetation, no suitable habitat for wildlife, and no wetlands. No Federal- or state-protected species are expected to occur in this area of McChord AFB. McChord AFB is committed to managing biological resources in accordance with the installation's INRMP (62 CES/CEV 2003a) and all applicable Federal, state, and local regulations and policies.

Cultural Resources. The Proposed Action has no potential to impact archaeological resources (see **Section 4.3.8**). Of the structures proposed for demolition under Project D1, one (Building 726) has been evaluated as not eligible for listing in the NRHP. Building 736 and the outdoor pool are substantially less than 50 years old and have no Cold War associations that would make them eligible for listing in the NRHP under Criterion Consideration G. Project D3, therefore, has no potential to impact architectural resources. No resources of significance to Native American tribes have been identified within McChord AFB to date. As part of its ongoing consultation program, however, McChord AFB will determine the potential of the Proposed Action to impact resources of traditional, religious, or cultural significance to Native American tribes in consultation with interested tribes.

Socioeconomic Resources and Environmental Justice. Negligible effects on socioeconomic resources would be expected from the proposed demolition of the Health and Wellness Center, outdoor pool, and bath house. The demolition activities would provide temporary employment for contractors in the area and would cost approximately $200,000. Demolition would occur entirely on McChord AFB and have little potential to affect off-installation residents adversely.

Infrastructure. Negligible effects on infrastructure resources would be expected from the demolition of the Health and Wellness Center, outdoor pool, and bath house. Removal of these facilities would result in less demand for certain utilities, but this reduction would be negligible when compared with total installation usage. Short-term adverse effects would be expected as a result of the generation of approximately 1,953 tons of demolition debris (USEPA 1998). This is a short-term adverse effect in that debris would only be generated during the demolition activities; however, debris that is not recycled would be landfilled, which would be considered a long-term irreversible adverse effect.

Hazardous Materials and Wastes. No long-term effects on hazardous materials management or hazardous waste generation would be expected as a result of the proposed demolition of these buildings. The implementation of operations and management plans for these materials and wastes would reduce the potential for adverse effects. Due to the construction date, surveys and records for abatement or remediation for ACM and LBP at Buildings 726 and 736 should be consulted prior to demolition. If incomplete or no records exist, these buildings should be assumed to contain both ACM and LBP. Sampling for ACM and LBP would occur prior to any demolition activities so that these materials can be properly characterized, handled, and disposed of in accordance with the AMP, LBP Management Plan, and USAF policy. Similarly, records for PCB should be consulted to determine what, if any, PCBs have

been removed. The demolition of these buildings would not affect or be affected by ERP sites. If any other hazardous materials such as cleaning solvents or fuels were stored at these buildings, they would be removed. Air conditioners, refrigerators, or other appliances using Freon, a known ozone-depleting substance, would be identified and disposed of properly.

4.4.2 Representative Construction Projects

4.4.2.1 C1. Construct a Physical Fitness Center

McChord AFB has two physical fitness centers (Buildings 726 and 729). Both of these facilities are inadequate and substandard for various reasons, which include age, lack of facility space, lack of expansion space, damaged and degraded interiors, poor handicap access, and poor heating and cooling systems. McChord AFB also has an outdoor pool and outdoor running tracks, but these facilities are only usable during fair weather. The USAF considers adequate physical fitness centers to be essential for well being and good morale. Project C1 would provide a new Physical Fitness Center, including indoor space for basketball, handball, and racquetball courts; an aquatic fitness and training pool; an indoor running track; weight-lifting equipment; multipurpose exercise rooms; locker rooms; latrines and showers; and administrative management. The Physical Fitness Center would be approximately 94,200 ft^2. The location of Project C1 is shown in **Figure 4-1**. The proposed site is currently undeveloped with mostly grassy vegetation and some trees. The primary constraint associated with this site is that it is within the historic district boundaries. See **Section 4.4.1.3** for discussion of the demolition associated with this project; Building 729 would be retained for future use.

Noise. Short-term minor intermittent adverse effects on noise levels would be expected as a result of the construction of the Physical Fitness Center. The noise emanating from the proposed construction of this complex would be localized, short-term, and intermittent during construction equipment and machinery operations. Heavy construction equipment would be operational periodically during the construction, which would limit the duration of increased noise levels. The construction of this facility would be expected to result in noise levels comparable to those indicated in **Table 4-9**. The proposed construction site is currently Open Space. Populations approximately 600 feet from the construction site would experience noise levels of approximately 64 dBA.

Table 4-9. Expected Noise Levels Resulting from Construction

dBA at 50 feet	dBA at 300 feet	dBA at 500 feet	dBA at 1,000 feet	dBA at 3,000 feet
85	70	65	59	50

Land Use. Negligible effects would be expected from construction of the proposed Physical Fitness Center. This facility would be constructed in the Open Space land use in the historic district. For further discussion of possible construction requirements in the historic district, see **Section 4.3.8**. While the land use category would change from Open Space to Community Commercial under the proposed project, no significant effects on land use are anticipated as a result of this change.

Air Quality. Short-term minor adverse effects would be expected as a result of the construction of the Physical Fitness Center. Construction activities would result in air emissions from the operation of heavy machinery. Fugitive particulate matter would be minimized by continually spraying water over the construction area. Construction of the facility would be expected to result in air emissions comparable to those indicated in **Table 4-10**.

Table 4-10. Expected Criteria Pollutant Emissions Resulting from Construction of Physical Fitness Center

Proposed Project	Project Size (ft^2)	NO_x (tpy)	VOC (tpy)	CO (tpy)	SO_x (tpy)	PM (tpy)
C1. Construct Physical Fitness Center	94,200	1.698	0.502	1.968	0.051	2.683
Conformity *de minimis* threshold		NA	NA	100	NA	NA
Regional PSIACQR Emissions Inventory		121,986	128,696	1,042,661	8,938	46,166
Project percentage of Regional Emissions Inventory (PSIAQCR)		0.0013%	0.0004%	0.0002%	0.0004%	0.0054%

Note: NA = not applicable

McChord AFB is classified as a maintenance area for CO, so the General Conformity Rule applies to the Proposed Action. Construction of the Physical Fitness Center would not exceed *de minimis* threshold levels. In addition, the criteria pollutants generated by the construction of this facility would not exceed 10 percent of the regional emissions values.

Safety. Short-term minor adverse effects on safety would be expected as a result of increased risk associated with construction-type activities. No long-term effects would be expected. Although all contractors are required to follow and implement OSHA standards to establish and maintain safety procedures, there would be an increased risk of accidents. Construction activities would be accomplished only in accordance with Federal, state, and local regulations to minimize safety hazards.

Geological Resources. Short-term, minor, adverse effects could occur from grading, excavating, and grooming of the soil. The proposed construction of the Physical Fitness Center would disturb approximately 94,200 ft^2 (2.2 acres) and require a NPDES storm water construction permit. The development of a site-specific SWPPP with erosion-control and storm water BMPs (such as silt fencing, sediment traps, and covering of soil piles) to manage runoff and erosion during and after construction would be required. The proposed construction project would also comply with the installation's SWPPP (62 CES/CEV 2005); SPCCP (62 CES/CEV 2006a); INRMP (62 CES/CEV 2003a); and all applicable Federal, state, and local regulations and policies.

Water Resources. Short-term, minor, adverse effects could occur from grading, excavating, and grooming of the soil and possible use of construction-related hazardous materials and other potential pollutants during construction. These activities have the potential to result in the transport of sediment and other construction-related pollutants in runoff from the construction site. The proposed construction of the Physical Fitness Center would require a NPDES construction permit. The construction project would implement spill prevention practices and require the development of a site-specific SWPPP with BMPs to manage storm water runoff during and after construction. The implementation of BMPs to manage erosion and sedimentation and storm water runoff during and after construction would minimize impacts on surface water and groundwater.

Long-term, minor, adverse effects could occur. The proposed Physical Fitness Center would add approximately 94,200 ft^2 (2.2 acres) of impervious surfaces. The proposed site is currently undeveloped with mostly grassy vegetation and some trees. The conversion of the undeveloped area to impervious surfaces would result in an increase in the volume and velocity of storm water runoff from the site.

However, a site-specific SWPPP would be developed and storm water BMPs would be implemented to manage increased storm water runoff after construction, minimizing long-term effects.

McChord AFB is committed to managing water resources in accordance with the installation's SWPPP (62 CES/CEV 2005); SPCCP (62 CES/CEV 2006a); and all applicable Federal, state, and local regulations and policies.

Biological Resources. Negligible adverse effects on biological resources would occur as a result of construction of the Physical Fitness Center. The proposed construction is in an undeveloped area and would require the removal of some vegetation and trees. This area provides minimal habitat for wildlife, and no wetlands occur in proximity to the area. No Federal- or state-protected species are expected to occur in this area of McChord AFB. McChord AFB is committed to managing biological resources in accordance with the installation's INRMP (62 CES/CEV 2003a) and all applicable Federal, state, and local regulations and policies.

Cultural Resources. The Proposed Action has no potential to impact archaeological resources (see **Section 4.3.8**). No resources of significance to Native American tribes have been identified within McChord AFB to date. As part of its ongoing consultation program, however, McChord AFB will determine the potential of the Proposed Action to impact resources of traditional, religious, or cultural significance to Native American tribes in consultation with interested tribes.

Building 729, constructed in 1985, is substantially less than 50 years old, and has no significant Cold War associations that would make it eligible for the NRHP under Criterion Consideration G. The new Physical Fitness Center would be constructed within the boundaries of the McChord Field historic district, and its design would be subject to review under the terms of the McChord AFB Architectural Compatibility Guide. Few specifications for new construction in the historic district are included; all designs are reviewed by the CRM, following the internal review procedures outlined in Section 4.3.1 of the ICRMP (MAFB 2004). Because procedures are in place to ensure that the design of the Physical Fitness Center is compatible with the architecture and finishes of the buildings within the historic district, completion of Project C1 has no potential to impact architectural resources.

Socioeconomic Resources and Environmental Justice. Minor beneficial effects on socioeconomic resources would be expected from the proposed construction of a Physical Fitness Center. The cost of construction for this facility would be $20 million, and it is assumed that local materials and contractors would be used. As of 2000, approximately 24,000 residents of Pierce County were employed in the construction industries. Therefore, it is assumed that there would be an ample number of construction workers available near McChord AFB. Construction would occur entirely on McChord AFB and would have little potential to adversely affect off-installation residents adversely.

Infrastructure. Overall, negligible effects on infrastructure resources would be expected from the construction of the proposed Physical Fitness Center. The increased demand for utility services, such as water supply, electricity, natural gas, and sanitary sewer, would be offset by the decreased demand resulting from the demolition of other facilities on the installation. This change in utility demand would be negligible when compared with total installation usage. Short-term adverse effects would be expected as a result of the generation of approximately 206 tons of construction debris (USEPA 1998). This is a short-term adverse effect in that debris would only be generated during construction activities; however, debris that is not recycled would be landfilled, which would be considered a long-term irreversible adverse effect. Construction debris is generally composed of clean materials, and most of this waste would be recycled or ground into gravel for reuse.

Hazardous Materials and Wastes. Short-term, negligible, adverse effects would be expected from the use of hazardous materials during the construction process. Because the USAF has adopted sustainable building practices set forth by the U.S. Green Building Council's Leadership in Energy and Environmental Design, materials used during construction would be the most environmentally preferred product; any hazardous materials used would be of a small quantity and used for a short duration. The proposed Physical Fitness Center would not generate new waste streams, and therefore, no modifications to McChord AFB's hazardous materials or hazardous waste management plans would be expected. The proposed facility is not near any ERP sites; therefore, construction workers would not be expected to encounter contamination during groundbreaking activities.

4.4.2.2 C2. Construct a Base Engineering Complex

The existing base engineering facilities are described in more detail in **Section 4.4.1.1**. These facilities are old and inadequate for their current uses. Project C2 would provide a new base engineering equipment facility, maintenance shops, and storage facilities, forming a Base Engineering Complex that is approximately 74,700 ft^2. Project C2 would also include the construction of pavements for use as open storage (approximately 148,100 ft^2). The new Base Engineering Complex would provide properly configured facilities for the efficient management, operation, maintenance, and repairs of facilities and utilities at McChord AFB. As shown in **Figure 4-1**, there are no sensitive areas or resources in this project area. The proposed site is currently undeveloped and consists of grass and trees.

Noise. Short-term minor intermittent adverse effects on noise levels would be expected as a result of the construction of the Base Engineering Complex. The noise emanating from the proposed construction of this complex would be localized, short-term, and intermittent during construction operations. Heavy construction equipment would be operational periodically during the construction, which would limit the duration of increased noise levels. The construction of this facility would be expected to result in noise levels comparable to those indicated in **Table 4-9**. Populations in an adjacent industrial facility would be approximately 150 feet from the source of the construction site and would experience noise levels of approximately 76 dBA.

Land Use. Negligible effects would be expected from construction of the proposed Base Engineering Complex. This facility would be constructed in an Open Space land use area. While the land use category would change from Open Space to Industrial under the proposed project, no significant effects on land use are anticipated as a result of this change.

Air Quality. Short-term minor adverse effects would be expected as a result of the construction of the Base Engineering Complex. Construction activities would result in air emissions from the operation of heavy machinery. Fugitive particulate matter would be minimized by continually spraying water over the construction area. Construction of the facility would be expected to result in air emissions comparable to those indicated in **Table 4-11**.

McChord AFB is classified as a maintenance area for CO, so the General Conformity Rule applies to the Proposed Action. Construction of the Base Engineering Complex would not exceed *de minimis* threshold levels. In addition, the criteria pollutants generated by the construction of this facility would not exceed 10 percent of the regional emissions values.

Table 4-11. Expected Criteria Pollutant Emissions Resulting from Construction of Base Engineering Complex

Proposed Project	Project Size (ft^2)	NO_x (tpy)	VOC (tpy)	CO (tpy)	SO_x (tpy)	PM (tpy)
C2. Construct Base Engineering Complex	222,800 (Facilities) 148,100 (pavements)	4.151	1.002	4.825	0.123	10.477
Conformity *de minimis* threshold		NA	NA	100	NA	NA
Regional PSIACQR Emissions Inventory		121,986	128,696	1,042,661	8,938	46,166
Project percentage of Regional Emissions Inventory (PSIAQCR)		0.0032%	0.0008%	0.0005%	0.0009%	0.0211%

Note: NA = not applicable

Safety. Short-term minor adverse effects on safety would be expected as a result of increased risk associated with construction-type activities. No long-term effects would be expected. Although all contractors are required to follow and implement OSHA standards to establish and maintain safety procedures, there would be an increased risk of accidents. Construction activities would be accomplished only in accordance with Federal, state, and local regulations to minimize safety hazards.

Geological Resources. Short-term, minor, adverse effects could occur from grading, excavating, and grooming of the soil. The proposed construction of the Base Engineering Complex would disturb approximately 222,800 ft^2 (5.1 acres) and require a NPDES construction storm water permit. The development of a site-specific SWPPP with erosion-control and storm water BMPs (such as silt fencing, sediment traps, and covering of soil piles) to manage runoff and erosion during and after construction would be required. The proposed construction project would also comply with the installation's SWPPP (62 CES/CEV 2005); SPCCP (62 CES/CEV 2006a); INRMP (62 CES/CES 2003a); and all applicable Federal, state, and local regulations and policies.

Water Resources. Short-term, minor, adverse effects could occur from grading, excavating, and grooming of the soil and possible use of construction-related hazardous materials and other potential pollutants during construction. These activities have the potential to result in the transport of sediment and other construction-related pollutants in runoff from the construction site. The proposed construction of the Base Engineering Complex would require a NPDES construction permit. The construction project would implement spill prevention practices, and development of a site-specific SWPPP with BMPs to manage storm water runoff during and after construction would also be required. The implementation BMPs to manage erosion and sedimentation and storm water runoff during and after construction would minimize impacts on surface water and groundwater.

Long-term, minor, adverse effects could occur. The proposed Base Engineering Complex would add approximately 222,800 ft^2 (5.1 acres) of impervious surfaces. The proposed site is currently undeveloped and consists of grass and trees. The conversion of the undeveloped area to impervious surfaces would result in an increase in the volume and velocity of storm water runoff from the site. However, a site-specific SWPPP would be developed and storm water BMPs would be implemented to manage increased storm water runoff after construction, minimizing long-term effects.

McChord AFB is committed to managing storm water in accordance with the installation's SWPPP (62 CES/CEV 2005); SPCCP (62 CES/CEV 2006a); and all applicable Federal, state, and local regulations and policies.

Biological Resources. Long-term, minor, adverse effects on biological resources would occur as a result of construction of the Base Engineering Complex. The proposed construction would be in an undeveloped area and would require the removal of approximately 5.1 acres of trees and grass. Construction equipment has the potential to result in damage to vegetation adjacent to the project area as a result of collision with or mechanical damage to plants (including roots). Wildlife could be disturbed in this area. Effects would result from the direct displacement of species during removal and the indirect effect of reduction of habitat. The reduction of vegetation would be negligible because of the availability of similar habitats in adjacent areas and throughout McChord AFB. Mortality of some less-mobile species could occur as a result of inability to move out of the way of operating equipment.

No wetlands occur in proximity to the area. No Federal- or state-protected species are expected to occur in this area of McChord AFB. McChord AFB is committed to managing biological resources in accordance with the installation's INRMP (62 CES/CEV 2003a) and all applicable Federal, state, and local regulations and policies.

Cultural Resources. The Proposed Action has no potential to impact archaeological resources (see **Section 4.3.8**). Project C2 would not result in demolition of any structures and, while the newly constructed facilities would be within the general viewshed of the historic district, there has been sufficient modern infill between the new facilities and the historic district so that the new facilities would not impact the viewshed of the structures within the historic district. Project C2, therefore, has no potential to impact architectural resources. No resources of significance to Native American tribes have been identified within McChord AFB to date. As part of its ongoing consultation program, however, McChord AFB will determine the potential of the Proposed Action to impact resources of traditional, religious, or cultural significance to Native American tribes in consultation with interested tribes.

Socioeconomic Resources and Environmental Justice. Minor beneficial effects on socioeconomic resources would be expected from the proposed construction of a Base Engineering Complex. The proposed cost of construction for this facility would be $11.1 million, and it is assumed that local materials and contractors would be used. Construction would occur entirely on McChord AFB and would have little potential to affect off-installation residents adversely.

Infrastructure. Overall, negligible effects on infrastructure resources would be expected from the construction of the proposed Base Engineering Complex. The increased demand for utility services, such as water supply, electricity, natural gas, and sanitary sewer, would be offset by the decreased demand resulting from the demolition of other facilities on the installation. This change in utility demand would be negligible when compared with total installation usage. Short-term adverse effects would be expected as a result of the generation of approximately 562 tons of construction debris (USEPA 1998). This is a short-term adverse effect in that debris would only be generated during construction activities; however, debris that is not recycled would be landfilled, which would be considered a long-term irreversible adverse effect. Construction debris is generally composed of clean materials, and most of this waste would be recycled or ground into gravel for reuse.

Hazardous Materials and Wastes. Short-term, negligible, adverse effects would be expected from the use of hazardous materials during the construction process. Because the USAF has adopted sustainable building practices set forth by the U.S. Green Building Council's Leadership in Energy and Environmental Design, materials used during construction would be the most environmentally preferred product; any hazardous materials used would be of a small quantity and used for a short duration. The

proposed Base Engineering Complex would not generate new waste streams, and therefore, no modifications to McChord AFB's hazardous materials or hazardous waste management plans would be expected. The proposed facility is not near any ERP sites; therefore, construction workers would not be expected to encounter contamination during groundbreaking activities. Long-term, negligible, beneficial effects would be expected from the operations of this new complex. The new complex would allow for efficient and modern storage and maintenance facilities which commonly use hazardous materials and produce hazardous wastes.

4.4.2.3 C3. Construct a 144-Person Dormitory (Phase 1)

McChord AFB's existing dormitory inventory consists of 752 rooms, but the room requirement is only 575 rooms. Of the existing inventory, 612 rooms are considered inadequately designed and configured for use as dormitories. A major USAF objective is to provide enlisted unaccompanied personnel with housing that is conducive to rest, relaxation, and personal well-being. Project C3 would provide a new two-story, 144-person dormitory in the four-person module arrangement with private living area and bathroom and shared social space in the building core. As shown in **Figure 4-1**, there are no sensitive areas or resources in this project area.

It is anticipated that two of the existing dormitory buildings, Building 1149 and 1150, would be reused as visiting quarters; this action is not considered for detailed analysis in the IDEA. The demolition of the remainder of the dormitories (Buildings 564, 565, 566, and 567) is analyzed as Project D4 in **Section 4.4.4** and not considered as a component of Project C3. The construction of additional dormitories to fulfill the required number of rooms is analyzed as Projects C5 and C6 in **Section 4.4.4** and not considered as a component of Project C3.

Noise. Short-term minor intermittent adverse effects on noise levels would be expected as a result of the construction of a new 144-person dormitory. The noise emanating from the proposed construction of this complex would be localized, short-term, and intermittent during construction operations. Heavy construction equipment would be operational periodically during the construction, which would limit the duration of increased noise levels. The construction of this facility would be expected to result in noise levels comparable to those indicated in **Table 4-9**. Populations approximately 600 feet from the construction site would experience noise levels of approximately 64 dBA.

Land Use. Negligible effects would be expected from construction of the proposed dormitory. The construction of this facility would occur within a Housing Unaccompanied land use area at McChord AFB. Present and future land uses would be compatible and no changes in land use functions would be expected.

Air Quality. Short-term minor adverse effects would be expected as a result of the construction of the 144-person dormitory (Phase I). Construction activities would result in air emissions from the operation of heavy machinery. Fugitive particulate matter would be minimized by continually spraying water over the construction area. Construction of the facility would be expected to result in air emissions comparable to those indicated in **Table 4-12**.

McChord AFB is classified as a maintenance area for CO, so the General Conformity Rule applies to the Proposed Action. Construction of the 144-person dormitory (Phase I) would not exceed *de minimis* threshold levels. In addition, the criteria pollutants generated by the construction of this facility would not exceed 10 percent of the regional emissions values.

Table 4-12. Expected Criteria Pollutant Emissions Resulting from Construction of 144-Person Dormitory (Phase I)

Proposed Project	Project Size (ft^2)	NO_x (tpy)	VOC (tpy)	CO (tpy)	SO_x (tpy)	PM (tpy)
C3. Construct 144-Person Dormitory (Phase I)	57,500	1.033	0.349	1.197	0.031	1.637
Conformity *de minimis* threshold		NA	NA	100	NA	NA
Regional PSIACQR Emissions Inventory		121,986	128,696	1,042,661	8,938	46,166
Project percentage of Regional Emissions Inventory (PSIAQCR)		0.0008%	0.0003%	0.0001%	0.0002%	0.0033%

Note: NA = not applicable

Safety. Short-term minor adverse effects on safety would be expected as a result of increased risk associated with construction-type activities. No long-term effects would be expected. Although all contractors are required to follow and implement OSHA standards to establish and maintain safety procedures, there would be an increased risk of accidents. Construction activities would be accomplished only in accordance with Federal, state, and local regulations to minimize safety hazards.

Geological Resources. Short-term, negligible, adverse effects could occur from grading, excavating, and grooming of the soil. The proposed construction of the dormitory (Phase I) would disturb approximately 28,750 ft^2 (0.66 acres). BMPs and erosion-control and storm water management techniques (such as silt fencing, sediment traps, and covering of soil piles) to manage runoff and erosion during and after construction would be required. The proposed construction project would also comply with the installation's SWPPP (62 CES/CEV 2005); SPCCP (62 CES/CEV 2006a); INRMP (62 CES/CEV 2003a); and all applicable Federal, state, and local regulations and policies.

Water Resources. Short-term, minor, adverse effects could occur from grading, excavating, and grooming of the soil and possible use of construction-related hazardous materials and other potential pollutants during construction. These activities have the potential to result in the transport of sediment and other construction-related pollutants in runoff from the construction site. The construction project would implement spill prevention practices and development of a site-specific SWPPP with BMPs to manage storm water runoff during and after construction would also be required. The implementation BMPs to manage erosion and sedimentation and storm water runoff during and after construction would minimize impacts on surface water and groundwater.

Long-term, negligible, adverse effects would be expected on water resources. The proposed 144-person dormitory would add approximately 28,750 ft^2 (0.66 acres) of impervious surfaces. The conversion of the undeveloped area to impervious surfaces would result in an increase in the volume and velocity of storm water runoff from the site. However, a site-specific SWPPP would be developed and storm water BMPs would be implemented to manage increased storm water runoff after construction, minimizing long-term effects.

McChord AFB is committed to managing storm water in accordance with the installation's SWPPP (62 CES/CEV 2005); SPCCP (62 CES/CEV 2006a); and all applicable Federal, state, and local regulations and policies.

Biological Resources. Negligible adverse effects on biological resources would occur as a result of construction of the dormitory, which would be in a heavily disturbed area. There is minimal existing vegetation, no suitable habitat for wildlife, and no wetlands. No Federal- or state-protected species are expected to occur in this area of McChord AFB. McChord AFB is committed to managing biological resources in accordance with the installation's INRMP (62 CES/CEV 2003a) and all applicable Federal, state, and local regulations and policies.

Cultural Resources. As noted above, the Proposed Action has no potential to impact archaeological resources. Buildings 1149 and 1150, both constructed in 1953, have been evaluated as not eligible for listing in the NRHP; these buildings can be modified without further review under Section 106 of the NHPA. Construction of the 144-person dormitory would also have no impact on the viewshed of the McChord Field historic district. Project C3, therefore, has no potential to impact architectural resources. No resources of significance to Native American tribes have been identified within McChord AFB to date. As part of its ongoing consultation program, however, McChord AFB will determine the potential of the Proposed Action to impact resources of traditional, religious, or cultural significance to Native American tribes in consultation with interested tribes.

Socioeconomic Resources and Environmental Justice. Minor beneficial effects on socioeconomic resources would be expected from the proposed construction of a dormitory. The cost of construction for this facility would be $13 million, and it is assumed that local materials and contractors would be used. Construction would occur entirely on McChord AFB and would have little potential to affect off-installation residents adversely.

Infrastructure. Overall, negligible effects on infrastructure resources would be expected from the construction of the proposed 144-person dormitory. The increased demand for utility services, such as water supply, electricity, natural gas, and sanitary sewer, would be offset by the decreased demand resulting from the demolition of other facilities on the installation. This change in utility demand would be negligible when compared with total installation usage. Short-term adverse effects would be expected as a result of the generation of approximately 126 tons of construction debris (USEPA 1998). This is a short-term adverse effect in that debris would only be generated during construction activities; however, debris that is not recycled would be landfilled, which would be considered a long-term irreversible adverse effect. Construction debris is generally composed of clean materials, and most of this waste would be recycled or ground into gravel for reuse.

Hazardous Materials and Wastes. Short-term, negligible, adverse effects would be expected from the use of hazardous materials during the construction process. Because the USAF has adopted sustainable building practices set forth by the U.S. Green Building Council's Leadership in Energy and Environmental Design, materials used during construction would be the most environmentally preferred product; any hazardous materials used would be of a small quantity and used for a short duration. The proposed 144-person dormitory would not generate new waste streams, and therefore, no modifications to McChord AFB's hazardous materials or hazardous waste management plans would be expected. The proposed facility is not near any ERP sites; therefore, construction workers would not be expected to encounter contamination during groundbreaking activities.

4.4.3 Representative Infrastructure Projects

4.4.3.1 I1. Repair Portions of Taxiway C

Taxiway C connects Taxiway H to F Ramp. This taxiway is in need of repair to ensure that aircraft operations are safe and efficient. Further deterioration of the concrete could render this taxiway unusable for aircraft operations. Project I1 would mill the top 2 inches of taxiway surface and add 2 inches of

asphalt west of the runway, and it would remove the top 8 inches and replace with 3 inches of base and 5 inches of asphalt east of the runway. Taxiway C would be restriped as required. The total area of Taxiway C (2.28 million ft^2) is included in this project. As shown in **Figure 4-1**, there are no sensitive areas or resources in this project area.

Noise. Short-term minor intermittent adverse effects on noise levels would be expected as a result of the repairs to Taxiway C. The noise emanating from the proposed demolition and construction of this taxiway would be localized, short-term, and intermittent during construction equipment and machinery operations. Heavy construction equipment would be operational periodically during the construction activities, which would limit the duration of increased noise levels. The demolition and paving of Taxiway C would be expected to result in noise levels comparable to those indicated in **Table 4-13**. This area of McChord AFB is used for Airfield and Aircraft Pavements, and the closest area where USAF personnel would be working regularly would be approximately 500 feet from the source of the construction site on the apron. Noise levels from the construction activities would be approximately 69 dBA. However, since this part of McChord AFB is in an area that is louder than a DNL of 75 dBA, construction noise associated with this project would contribute negligibly to the noise environment.

Table 4-13. Expected Noise Levels Resulting from Paving

dBA at 50 feet	dBA at 300 feet	dBA at 500 feet	dBA at 1,000 feet	dBA at 3,000 feet
89	74	69	63	54

Land Use. Negligible effects would be expected from repairs to Taxiway C. The construction of this facility is currently within the Airfield and Aircraft Pavements land use area at McChord AFB. Present and future land uses would be compatible and no changes in land use functions would be expected.

Air Quality. Short-term minor adverse effects would be expected as a result of repairing portions of Taxiway C. Construction activities would result in air emissions from the operation of heavy machinery. Fugitive particulate matter would be minimized by continually spraying water over the construction area. Repairing portions of Taxiway C would be expected to result in air emissions comparable to those indicated in **Table 4-14**.

Table 4-14. Expected Criteria Pollutant Emissions Resulting from Repairing Portions of Taxiway C

Proposed Project	Project Size (ft^2)	NO_x (tpy)	VOC (tpy)	CO (tpy)	SO_x (tpy)	PM (tpy)
I1. Repair Portions of Taxiway C	2,280,000	21.768	3.442	27.945	0.435	64.196
Conformity *de minimis* threshold		NA	NA	100	NA	NA
Regional PSIACQR Emissions Inventory		121,986	128,696	1,042,661	8,938	46,166
Project percentage of Regional Emissions Inventory (PSIAQCR)		0.0166%	0.0026%	0.0026%	0.0032%	0.1291%

Note: NA = not applicable

McChord AFB is classified as a maintenance area for CO, so the General Conformity Rule applies to the Proposed Action. Repairing portions of Taxiway C would not exceed *de minimis* threshold levels. In addition, the criteria pollutants generated by the repair of this infrastructure would not exceed 10 percent of the regional emissions values.

Safety. Short-term minor adverse effects on safety would be expected as a result of increased risk associated with construction-type activities. No long-term effects would be expected. All repair work along Taxiway C would be located within QD clear areas and airfield clearance zones, and workers would be exposed to high levels of noise. Although all contractors are required to follow and implement OSHA standards to establish and maintain safety procedures, there would be an increased risk of accidents. Construction activities would be accomplished only in accordance with Federal, state, and local regulations to minimize safety hazards.

Geological Resources. Short-term, minor, adverse effects could occur from grading, excavating, and grooming of the soil east of the runway if repair of the taxiway requires excavation into the underlying soils. Soils at the runway have been heavily disturbed by the previous development of the site. The proposed repair of Taxiway C might require a NPDES construction storm water permit if pavement removal would expose 1 acre or more of soil. If a NPDES permit were required, the development of a site-specific SWPPP with BMPs and erosion-control techniques (such as silt fencing, sediment traps, and covering of soil piles) to manage runoff and erosion during and after pavement repair would be required. The proposed infrastructure project would also comply with the installation's SWPPP (62 CES/CEV 2005); SPCCP (62 CES/CEV 2006a); INRMP (62 CES/CEV 2003a); and all applicable Federal, state, and local regulations and policies.

Water Resources. Short-term, minor, adverse effects could occur from grading, excavating, and grooming of the soil and possible use of construction-related hazardous materials and other potential pollutants during construction. These activities have the potential to result in the transport of sediment and other construction-related pollutants in runoff from the construction site. If pavement removal would expose 1 acre or more of soil, then a NPDES permit might be required. The applicability of NPDES permitting would be determined during the design phase and prior to implementation.

The proposed repair of Taxiway C would not increase impervious surfaces. Therefore there would be no long-term effects on water resources associated with increased impervious surfaces.

McChord AFB is committed to managing storm water in accordance with the installation's SWPPP (62 CES/CEV 2005); SPCCP (62 CES/CEV 2006a); all applicable Federal, state, and local regulations and policies.

Biological Resources. Negligible adverse effects on biological resources would occur as a result of the repair of Taxiway C, which is in a heavily disturbed area. There is minimal existing vegetation, no suitable habitat for wildlife, and no wetlands. No Federal- or state-protected species are expected to occur in this area of McChord AFB. McChord AFB is committed to managing biological resources in accordance with the installation's INRMP (62 CES/CEV 2003a) and all applicable Federal, state, and local regulations and policies.

Cultural Resources. The Proposed Action has no potential to impact archaeological resources (see **Section 4.3.8**). This project does not involve demolition of structures or construction of new visual elements that would impact the McChord Field Historic District. Project I1, therefore, has no potential to impact architectural resources. No resources of significance to Native American tribes have been identified within McChord AFB to date. As part of its ongoing consultation program, however,

McChord AFB will determine the potential of the Proposed Action to impact resources of traditional, religious, or cultural significance to Native American tribes in consultation with interested tribes.

Socioeconomic Resources and Environmental Justice. Negligible to minor beneficial effects on socioeconomic resources would be expected from the proposed repair of portions of Taxiway C. The cost of repair for Taxiway C would be $700,000, and it is assumed that local materials and contractors would be used. Repair activities would occur entirely on McChord AFB and would have little potential to affect off-installation residents adversely.

Infrastructure. Overall, negligible effects on infrastructure resources would be expected from the repair of Taxiway C. Short-term adverse effects would be expected as a result of the generation of approximately 74,100 tons of construction debris (USEPA 1998). This is a short-term adverse effect in that debris would only be generated during construction activities; however, debris that is not recycled would be landfilled, which would be considered a long-term irreversible adverse effect. Most of this waste would be recycled or ground into gravel for reuse.

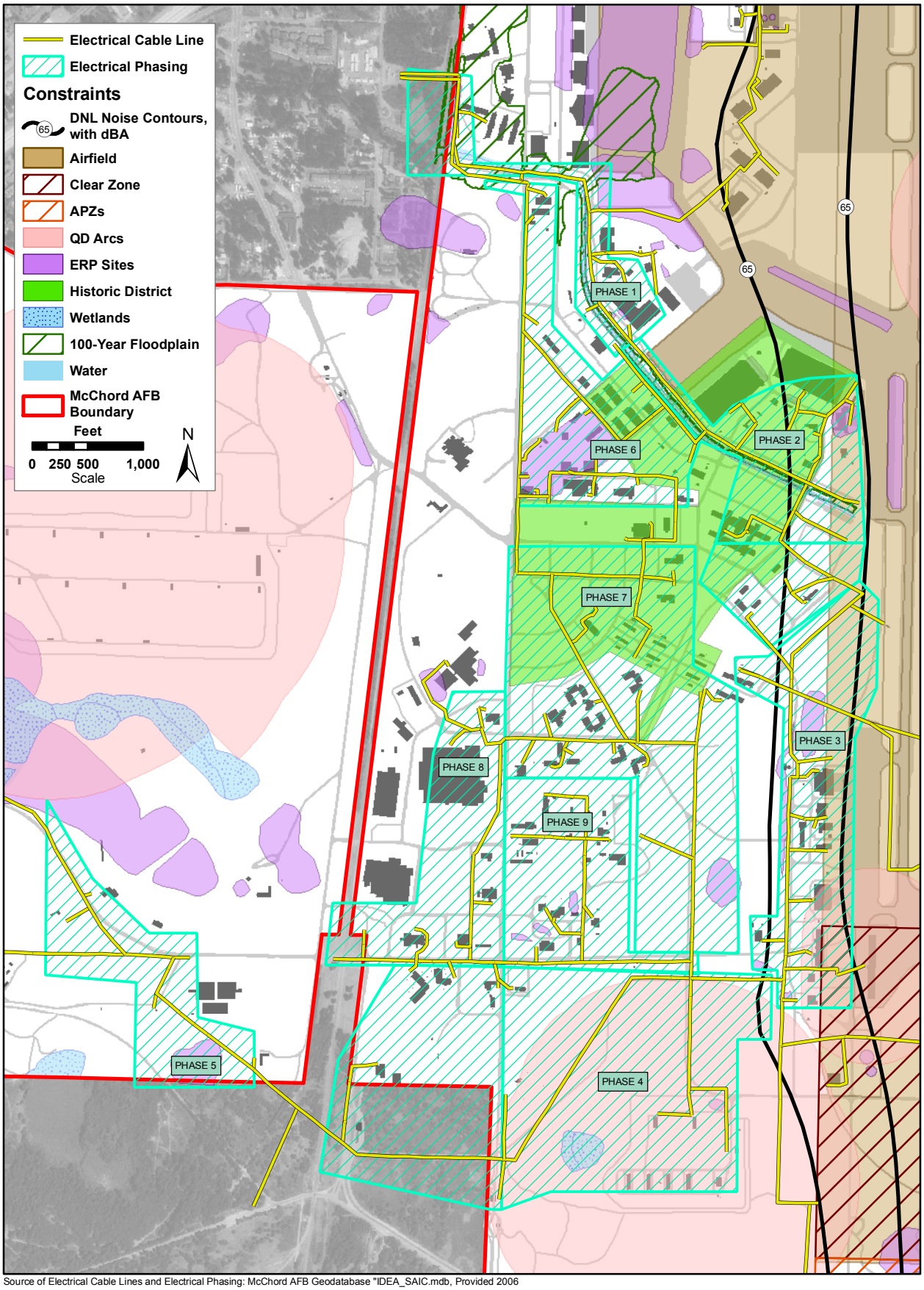
Hazardous Materials and Wastes. Short-term, minor, adverse effects would be expected from the use of hazardous materials during the pavement repair process. No long-term effects would be expected.

4.4.3.2 I2. Replace Overhead Electrical Distribution with Underground Distribution

The electrical distribution system at McChord AFB primarily consists of a combination of overhead and underground power lines. Currently, the overhead lines are in need of repair, substations cannot backfeed power adequately, and the 4,160-volt distribution is outdated. Project I2 would replace the overhead electrical distribution with underground electrical distribution over much of the installation. Replacement of Feeders 13 and 14 is programmed over nine phases, and each phase would be implemented as funding becomes available. Generally, underground lines would be installed to mirror the existing overhead electrical lines, though there could be new routes identified that would be more economically, operationally, or environmentally preferable. Standard installation of underground electrical distribution would include 20-inch concrete-encased duct banks, buried to a depth of 30 inches below grade in a trench that is 30 inches wide. New switches and transformers would also be installed to provide a more reliable and redundant electrical distribution system. It is estimated that this project would disturb approximately 300,000 ft^2. It would be operationally safer and more efficient for all electrical lines to be underground. Furthermore, increasing the cable size of the electrical system would save money in the long run.

Figure 4-2 shows the existing configuration of the overhead electrical distribution system in relation to known environmental constraints. As shown in **Figure 4-2**, there are several sensitive areas that could potentially be affected by underground installation activities. When there are environmental sensitive areas that could be affected by the installation of underground utilities, such as wetlands, then the existing overhead paths would continue to be used. Submarine trenching is not within the scope of Project I2.

Noise. Short-term minor intermittent adverse effects on noise levels would be expected as a result of the replacement of overhead electrical distribution with underground distribution. The noise emanating from the proposed utility work would be localized, short-term, and intermittent during machinery operations. Heavy construction equipment would be operational periodically during the demolition, which would limit the duration of increased noise levels. The replacement of overhead distribution and the installation of underground distribution would be expected to result in noise levels comparable to those indicated in **Table 4-15**. The proposed utility would occur over a large portion of the installation and could affect both on- and off-installation populations at various phases of the project.



Source of Electrical Cable Lines and Electrical Phasing: McChord AFB Geodatabase "IDEA_SAIC.mdb, Provided 2006

Figure 4-2. Proposed Project I2 Relative to Known Constraints

Table 4-15. Expected Noise Levels Resulting from Grading

dBA at 50 feet	dBA at 300 feet	dBA at 500 feet	dBA at 1,000 feet	dBA at 3,000 feet
92	76	72	66	56

Land Use. No effects would be expected from the replacement of overhead electrical distribution with underground distribution. Present and future land uses would be compatible and no changes in land use functions would be expected.

Air Quality. Short-term minor adverse effects would be expected as a result of the replacement of overhead electrical distribution with underground distribution. Construction activities would result in air emissions from the operation of heavy machinery. Fugitive particulate matter would be minimized by continually spraying water over the construction area. Replacement of overhead electrical distribution with underground distribution would be expected to result in air emissions comparable to those indicated in **Table 4-16**.

McChord AFB is classified as a maintenance area for CO, so the General Conformity Rule applies to the Proposed Action. Replacing the overhead electrical system with an underground system would not exceed *de minimis* threshold levels. In addition, the criteria pollutants generated by the replacement of this infrastructure would not exceed 10 percent of the regional emissions values.

Table 4-16. Expected Criteria Pollutant Emissions Resulting from Replace Overhead Electrical Distribution with Underground Distribution

Proposed Project	Project Size (ft^2)	NO_x (tpy)	VOC (tpy)	CO (tpy)	SO_x (tpy)	PM (tpy)
I2. Replace Overhead Electrical Distribution with Underground Distribution	300,000	0.083	0.012	0.097	0.002	8.363
Conformity *de minimis* threshold		NA	NA	100	NA	NA
Regional PSIACQR Emissions Inventory		121,986	128,696	1,042,661	8,938	46,166
Project percentage of Regional Emissions Inventory (PSIAQCR)		0.0001%	0.00001%	0.00001%	0.00001%	0.0168%

Note: NA = not applicable

Safety. Short-term minor adverse effects on safety would be expected as a result of increased risk associated with construction-type activities. No long-term effects would be expected. Although all contractors are required to follow and implement OSHA standards to establish and maintain safety procedures, there would be an increased risk of accidents. Construction activities would be accomplished only in accordance with Federal, state, and local regulations to minimize safety hazards. In addition, replacing the overhead electrical distribution with underground distribution would be expected to increase operational safety on McChord AFB.

Geological Resources. Short-term, minor, adverse effects could occur from grading, excavating, and grooming of the soil associated with the underground burial of electrical distribution lines. Approximately 300,000 ft^2 (6.9 acres) of soil would be disturbed. Soils in the areas of this proposed project have been heavily disturbed by previous activities. The proposed underground burial of electrical distribution lines would require a NPDES construction storm water permit. The development of a site-specific SWPPP with BMPs and erosion-control and storm water techniques (such as silt fencing, sediment traps, and covering of soil piles) to manage runoff and erosion during trenching would be required. Therefore, effects on soils would be minimized. Disturbed areas would be replanted with native vegetation, as necessary. The proposed demolition project would also comply with the installation's SWPPP (62 CES/CEV 2005); SPCCP (62 CES/CEV 2006a); INRMP (62 CES/CEV 2003a); and all applicable Federal, state, and local regulations and policies.

Water Resources. Short-term, minor, adverse effects could occur from trenching of the soil associated with underground burial of the electrical distribution lines. These activities have the potential to result in the transport of sediment and other construction-related pollutants in runoff from the construction site. The burial of electrical distribution lines during Phases 1, 2, and 6 would occur in the vicinity of Clover Creek. The placement of the electrical distribution lines would require a NPDES construction permit. The project would implement spill prevention practices and development of a site-specific SWPPP with BMPs to manage storm water runoff during and after construction would also be required. The implementation BMPs to manage erosion and sedimentation and storm water runoff during and after construction would minimize impacts on surface water and groundwater.

There would be no increase of impervious surface. Therefore, no long-term effects associated with increased impervious surfaces would be expected.

McChord AFB is committed to managing storm water in accordance with the installation's SWPPP (62 CES/CEV 2005); SPCCP (62 CES/CEV 2006a); and all applicable Federal, state, and local regulations and policies.

Biological Resources. Short-term and long-term minor adverse effects on biological resources would occur as a result of the burial of the electrical distribution lines. Although vegetation would be affected by this proposed project, none of the areas affected would be considered unique. Trenching could cut through roots. Root damage over time has the potential to kill the affected plants. In forested areas, construction equipment has the potential to result in damage to vegetation as a result of collision with or mechanical damage to plants. Disturbed areas would be landscaped in accordance with McChord AFB standards and the installation INRMP. Underground burial would not occur in wetlands, but would occur adjacent to wetlands in Phases 1, 2, and 6 of this project. Electrical distribution lines would remain overhead in areas where they cross wetlands in Phases 1 and 2 of this project. No Federal- or state-protected species are expected to occur in this area of McChord AFB. McChord AFB is committed to managing biological resources in accordance with the installation's INRMP (62 CES/CEV 2003a) and all applicable Federal, state, and local regulations and policies.

Cultural Resources. The Proposed Action has no potential to impact archaeological resources (see **Section 4.3.8**). The removal of aboveground electrical lines (and poles) and replacement of that system with an underground system would not directly impact any architectural resources, but would impact the viewshed of the McChord Field Historic District. At least a portion of the aboveground electrical system was constructed at the same time as the buildings within the historic district and has been part of their viewshed. The transformer vaults and electrical system station (Buildings 422, 610, and 733) are all contributing elements to the historic district. Removal of this system from the viewshed could constitute an adverse effect on the historic district under Section 106 of the NHPA. If this project is deemed an adverse effect as a result of consultation between McChord AFB and the SHPO, the adverse effect will

need to be mitigated and a Memorandum of Agreement prepared. No resources of significance to Native American tribes have been identified within McChord AFB to date. As part of its ongoing consultation program, however, McChord AFB will determine the potential of the Proposed Action to impact resources of traditional, religious, or cultural significance to Native American tribes in consultation with interested tribes.

Socioeconomic Resources and Environmental Justice. Negligible to minor beneficial effects on socioeconomic resources would be expected from the proposed replacement of the overhead electrical distribution system with an underground distribution system. The associated construction would occur entirely on McChord AFB and would have little potential to affect off-installation residents adversely.

Infrastructure. Overall, negligible effects on infrastructure resources would be expected from the replacement of overhead electrical distribution with underground distribution. Negligible construction debris would be generated. Clean excess soil could be used as fill material for other construction projects, if needed.

Hazardous Materials and Wastes. No adverse impacts would be expected from the replacement of the overhead electrical system with underground distribution. Prior to removal and disposal, transformers would have to be surveyed and analyzed to determine if they are PCB-contaminated. If it is determined that these items are PCB-contaminated they would be taken to the DRMO at Fort Lewis and disposed of. Secondly, some of the proposed electrical system upgrades would traverse ERP sites. Although all of ERP sites have remediation under way or no further action planned, any ground-disturbing activities within ERP sites must be coordinated with the 62 CES/CEV. If it is determined that placing the electrical system underground would be detrimental or would adversely affect remediation activities at that site, then the aboveground system would remain or a new underground pathway would be pursued.

4.4.3.3 I3. Replace Bulk Fuel Storage and Distribution Components and POL Facilities

The mission capability and reliability of the C-17 airlift aircraft has resulted in increased fuel consumption at McChord AFB. Some portions of the existing fuel receipt and transfer system are inadequate to meet demands. The system is old and could fail, which would have adverse effects on the mission and the environment. Project I3 would replace and upgrade the bulk fuel storage, fuel distribution, and POL facilities in three general areas at McChord AFB, which are shown in **Figure 4-3**. The proposed activities are described in more detail in the following text.

The first component of this project is to upgrade the bulk fuel offload and storage area. The current fuel transfer system was installed in the 1950s and uses three 12,000-gallon underground storage tanks (USTs) to move fuel between tanks. System capabilities do not allow simultaneous receipt and transfer directly to the flightline. Furthermore, the USTs are confined space and an environmental hazard that require constant monitoring. Within the bulk storage POL area, personnel are using an old pumphouse facility for POL operations that is not designed for habitation. The absence of air conditioning in this facility is also detrimental to various computer systems. Project I3 would provide new fill stand and offload facilities for the simultaneous receiving of fuel from pipeline or trucks into the bulk fuel storage. Pavements, sidewalks, and canopies would be replaced as needed. This portion of the project area is already primarily pavement, and the proposed construction and infrastructure upgrades would disturb minimal area. Project I3 would also provide a new JP-8 bulk fuel pumphouse that includes a control room; distribution piping manifold; and all associated valves, piping, electrical system, spill containment, pumps, and filter separators (totaling 3,230 ft^2). This portion of the project area is largely impervious. Project I3 would also include a bulk storage operations facility and POV parking (totaling approximately 1,000 ft^2). Construction of the bulk storage operations area would require the removal of some vegetation. See **Figure 4-3** for locations of construction and upgrades.

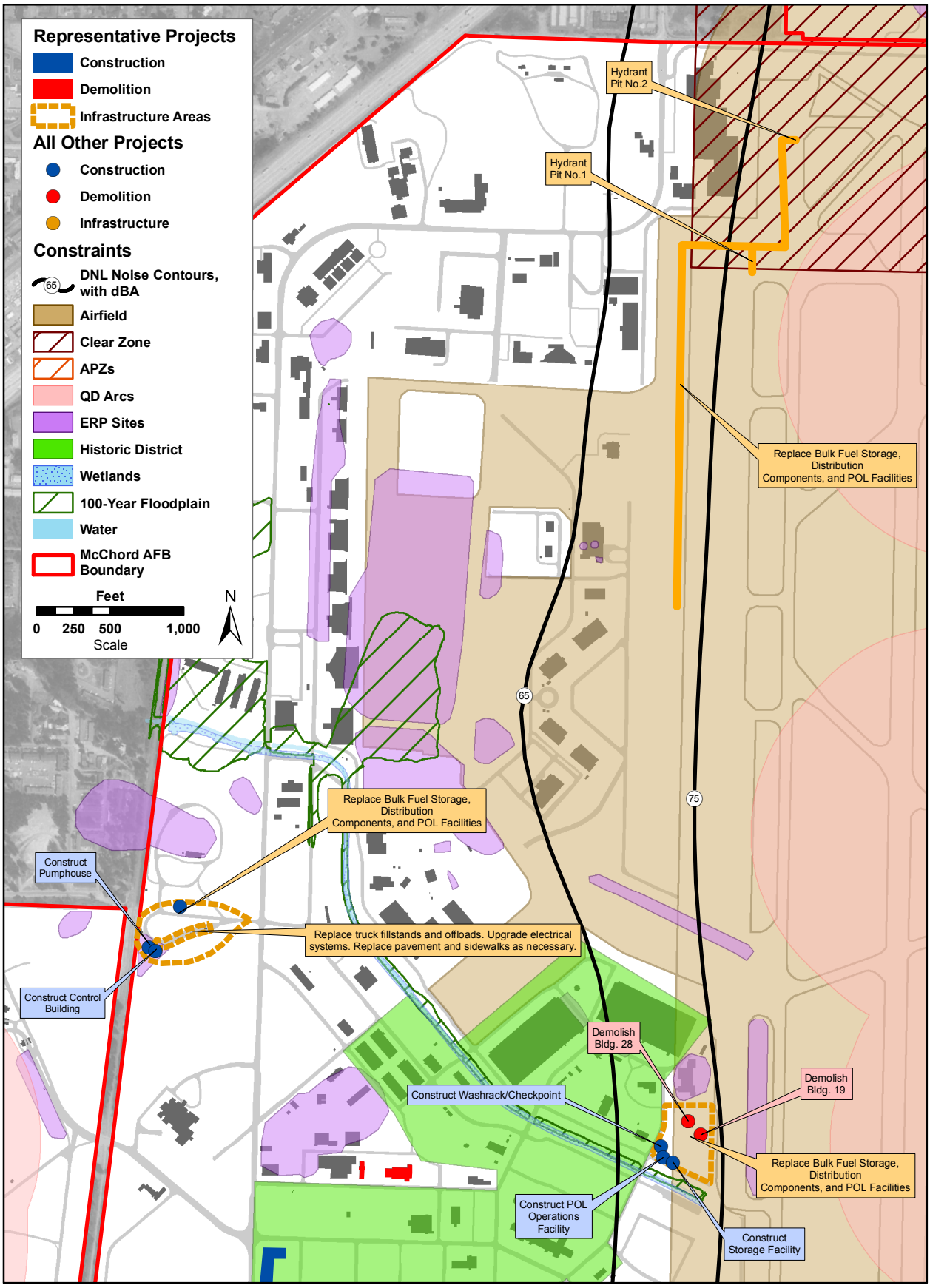


Figure 4-3. Proposed Project I3 Relative to Known Constraints

The hydrant pits and pumpstation that service the transient heavy cargo aircraft are part of a separate fueling system that was constructed in the 1960s. There is also a newer, faster Type III system on the B and J ramps that supports C-17 aircraft. The second component of this project would provide valve pit and piping and new JP-8 hydrants to connect two existing hydrant outlets to the Type III hydrant system and abandon and demolish the old hydrant system. **Figure 4-3** shows the area on the B and J ramps where piping would be replaced and the locations of the two new hydrants.

The third component of this project would include the demolition of Buildings 19 and 28. Building 19 is used for hazardous storage (224 ft^2), and Building 28 is the existing POL facility (3,501 ft^2). Building 28 is a prefabricated structure that was originally constructed in 1969; an addition was added in 1985 when Building 19 was constructed. These facilities require continuous maintenance and repairs. Under Project I3, a new POL facility and hazardous storage area would be constructed (totaling 3,850 ft^2). Additionally, a vehicle washrack and checkpoint facility would be constructed in the refueler truck parking area (totaling 248 ft^2). This area of McChord AFB is already primarily pavement, and there are no sensitive resources in the project area. The proposed demolition and construction for this component are shown in **Figure 4-3**.

Noise. Short-term minor intermittent adverse effects on noise levels would be expected as a result of the replacement of bulk fuels storage and distribution components. The noise emanating from the proposed demolition and construction of these facilities would be localized, short-term, and intermittent during construction equipment and machinery operations. Heavy construction equipment would be operational periodically during the demolition, which would limit the duration of increased noise levels. The replacement of the fuel storage and distribution components would be expected to result in noise levels comparable to those indicated in **Table 4-15**. The proposed replacements would occur in several areas at the installation and would affect both on- and off-installation populations. The nearest population to the construction and demolition of these facilities would be off-installation on McChord Drive, approximately 300 feet northwest. Noise levels reaching populations in this area would be approximately 76 dBA.

Land Use. Negligible effects would be expected from replacement of bulk fuel storage and distribution components. The demolition and construction of these facilities would be within the Industrial and Airfield land use areas at McChord AFB. Present and future land uses would be compatible and no changes in land use functions would be expected.

Air Quality. Short-term minor adverse effects would be expected as a result of replacing bulk fuel storage and distribution components and POL facilities. Construction and demolition activities would result in air emissions from the operation of heavy machinery. Fugitive particulate matter would be minimized by continually spraying water over the construction area. Replacing bulk fuel storage and distribution components and POL facilities would be expected to result in air emissions comparable to those indicated in **Table 4-17**.

McChord AFB is classified as a maintenance area for CO, so the General Conformity Rule applies to the Proposed Action. Replacing bulk fuel storage and distribution components and POL facilities would not exceed *de minimis* threshold levels. In addition, the criteria pollutants generated by this project would not exceed 10 percent of the regional emissions values.

Table 4-17. Expected Criteria Pollutant Emissions Resulting from Replacing Bulk Fuel Storage and Distribution Components and POL Facilities

Proposed Project	Project Size (ft^2)	NO_x (tpy)	VOC (tpy)	CO (tpy)	SO_x (tpy)	PM (tpy)
I3. Replace Bulk Fuel Storage and Distribution Components and POL Facilities	392,000 (various demolition, construction, and pavements)	0.494	0.137	0.648	0.011	10.940
Conformity *de minimis* threshold		NA	NA	100	NA	NA
Regional PSIACQR Emissions Inventory		121,986	128,696	1,042,661	8,938	46,166
Project percentage of Regional Emissions Inventory (PSIAQCR)		0.0004%	0.0001%	0.0001%	0.0001%	0.0220%

Note: NA = not applicable

Safety. Short-term minor adverse effects on safety would be expected as a result of increased risk associated with construction-type activities. No long-term effects would be expected. Portions of this proposed project would be within QD clear areas and airfield clearance zones, and workers would be exposed to high levels of noise. Although all contractors are required to follow and implement OSHA standards to establish and maintain safety procedures, there would be an increased risk of accidents. Construction activities would be accomplished only in accordance with Federal, state, and local regulations to minimize safety hazards.

Geological Resources. Short-term, minor, adverse effects could occur from grading, excavating, and grooming of the soil as a result of this project. However, it is likely that the soils in these areas are heavily disturbed. The proposed infrastructure project would require a NPDES construction storm water permit. The development of a site-specific SWPPP with BMPs and erosion-control techniques (such as silt fencing, sediment traps, and covering of soil piles) to manage runoff and erosion during and after pavement repair would be required. The proposed infrastructure project would also comply with the installation's SWPPP (62 CES/CEV 2005); SPCCP (62 CES/CEV 2006a); INRMP (62 CES/CEV 2003a); and all applicable Federal, state, and local regulations and policies.

Water Resources. The demolition and construction associated with replacing the bulk fuel storage and distribution components and POL facilities could result in short-term, minor, adverse effects on water resources as a result of erosion and sedimentation associated with ground-disturbing activities. The proposed infrastructure project would require a NPDES construction storm water permit. The development of a site-specific SWPPP with BMPs and erosion-control and storm water management techniques (such as silt fencing, sediment traps, and covering of soil piles) to manage runoff and erosion during and after construction would be required.

Overall, there would be negligible changes in impervious surfaces associated with the proposed project. Therefore, no long-term effects associated with increased impervious surfaces would be expected.

Construction of the vehicle washrack and checkpoint, POL facility, and storage facility, would occur within 300 feet of Clover Creek. The operation of the washrack proposed as part of this project might require a NPDES permit if a discharge is required. The construction and operations associated with this project would comply with the installation's SWPPP (62 CES/CEV 2005); SPCCP (62 CES/CEV 2006a);

and all applicable Federal, state, and local regulations and policies. This would minimize potential for adverse effects on Clover Creek.

Biological Resources. Short-term minor adverse effects on biological resources would occur as a result of replacing the bulk fuel storage and distribution components and POL facilities. Although vegetation would be affected by this proposed project, none of the areas affected would be considered unique, sensitive, or managed forest stands. The third component of this project, which includes a new POL facility and hazardous storage area, does occur between two Garry oak stands, in an area that has been previously developed and disturbed. This project would not cause additional fragmentation of the habitats. All areas that are disturbed as a result of this project would be landscaped in accordance with McChord AFB standards and the installation INRMP. No Federal- or state-protected species are expected to occur in this area of McChord AFB. McChord AFB is committed to managing biological resources in accordance with the installation's INRMP (62 CES/CEV 2003a) and all applicable Federal, state, and local regulations and policies.

Cultural Resources. The Proposed Action has no potential to impact archaeological resources (see **Section 4.3.8**). Building 19, constructed in 1985, and Building 28, constructed in 1969, are less than 50 years old and have no significant Cold War associations; accordingly, demolition of these buildings requires no review under Section 106 of the NHPA. Although the demolition of these buildings and their replacement with new construction would occur adjacent to the McChord Field Historic District, the existing POL and hazardous storage facilities have been in the viewshed of the historic district since 1985. Replacement of the structures with new structures having the same function would not represent a new impact on the viewshed. No other structures would be demolished as part of this project. Project I3, therefore, has no potential to impact architectural resources. No resources of significance to Native American tribes have been identified within McChord AFB to date. As part of its ongoing consultation program, however, McChord AFB will determine the potential of the Proposed Action to impact resources of traditional, religious, or cultural significance to Native American tribes in consultation with interested tribes.

Socioeconomic Resources and Environmental Justice. Minor beneficial effects on socioeconomic resources would be expected from the replacement of bulk fuel storage, distribution components, and POL facilities. The cost of replacement would be approximately $11 million, and it is assumed that local contractors would be used. Demolition would occur entirely on McChord AFB and would have little potential to affect off-installation residents.

Infrastructure. Overall, negligible effects on infrastructure resources would be expected from the replacement of bulk fuel storage and distribution components and POL facilities. Short-term adverse effects would be expected as a result of the generation of approximately 30,103 tons of construction debris (USEPA 1998). This is a short-term adverse effect in that debris would only be generated during construction activities; however, debris that is not recycled would be landfilled, which would be considered a long-term irreversible adverse effect. Construction debris is generally composed of clean materials, and most of this waste would be recycled or ground into gravel for reuse.

Hazardous Materials and Wastes. Short-term, minor, adverse effects would be expected from the replacement of the bulk fuel storage and distribution components and POL facilities. It is unknown whether some of these components could have ACM or LBP. Prior to removal it would be necessary to analyze these components. Also, POL within the system would be removed. If ACM or LBP surveys exist for Buildings 19 and 25, they should be consulted prior to their demolition. Long-term, minor beneficial effects would be expected from the completion of this infrastructure upgrade. As previously stated, the current distribution system is out-dated and requires continuous repairs, many of which would likely be corrected by a modern and more efficient system.

4.4.4 Analysis of All Proposed Projects

Table 4-18 summarizes the potential environmental consequences associated with the remainder of the installation development projects that are identified in **Appendix A** but not previously analyzed as representative projects in **Sections 4.4.1**, **4.4.2**, and **4.4.3**. The proposed locations for these projects are identified in **Figure 4-4**. The intent of the table in this section is to focus on those potential environmental consequences that would be expected as a result of location- or operation-specific activities. All demolition and construction activities generally would be expected to result in some increased noise, increased air emissions, potential for erosion and transport of sediment into surface water bodies, generation of small amounts of hazardous materials and wastes, and generation of construction and demolition waste. All demolition and construction activities generally would be expected to result in minor beneficial effects on socioeconomics as a result of job creation and materials procurement. Furthermore, it should be assumed that demolition or renovation activities in older buildings have the potential to disturb asbestos or LBP and the appropriate identification, handling, removal, and disposal of those materials would occur in accordance with existing McChord AFB management plans and Federal, state, DOD, and USAF regulations and guidance. These types of short-term, construction-related effects are identified in **Section 4.3** in the general analysis and **Sections 4.4.1**, **4.4.2**, and **4.4.3** in the detailed analyses of the representative projects. Therefore, they are not identified as constraints to development in **Table 4-18** for each project; it is assumed that, in the absence of unique constraints, the potential environmental effects associated with the size of a demolition or construction project would be similar to those described in **Sections 4.4.1**, **4.4.2**, and **4.4.3**. The potential environmental consequences associated with implementation of all other projects are analyzed following **Table 4-18**; the potential constraints that are identified in **Table 4-18** (i.e., those not identified as "no or negligible effects") are elaborated upon in the following analysis by resource area.

All construction and demolition activities would adhere to McChord AFB's existing plans and policies that have been identified and referenced throughout **Sections 2**, **3**, **4**, and **7** of this IDEA. **Table 4-18** is not meant to substitute for or initiate coordination that might be required as a result of the proposed activities; it is meant to identify potential effects on sensitive resources. The following summarizes the potential adverse effects associated with constraints for the projects identified in **Appendix A** and the existing management plans and policies regarding those affected resources.

Noise. Implementation of all proposed projects would be expected to result in short-term minor adverse effects on the noise environment from the various pieces of equipment used during demolition, construction, or infrastructure upgrade activities. The projects identified in **Appendix A** would be implemented at different times and different locations over the next 5 years. It is possible that several projects would occur simultaneously but would not be expected to result in adverse effects beyond those described in **Sections 4.3**, **4.4.1**, **4.4.2**, and **4.4.3**.

Land Use. Implementation of all proposed projects identified in **Appendix A** would be expected to result in overall beneficial effects on land use. Proposed demolition projects on McChord AFB would remove old and outdated facilities and make land available in previously disturbed areas for proposed construction projects. The Proposed Action would generally enhance land use functionalities; future land use and all proposed project locations are shown in **Figure 4-5**.

Some proposed projects identified in **Table 4-18** have the potential to result in incompatible land use because new construction would occur within the 65 dBA noise zone. Refer to the discussion in **Section 4.3.2** regarding construction when noise levels are greater than 65 dBA. Noise level reduction can be achieved through incorporation of noise attenuation measures into the design and construction of the structure.

Table 4-18. Potential Environmental Consequences from All Proposed Projects Listed in Appendix A

Project Identification Number and Title	Land Use	Safety	Geological Resources	Water Resources	Biological Resources	Cultural Resources	Hazardous Materials and Wastes
Proposed Demolition Projects							
D4. Demolish Bldgs. 564, 565, 566, and 567 (Dormitories)	-	-	⊗ NPDES	⊗ NPDES	-	-	-
D5. Demolish Bldg. 6 (Fire Station)	-	⊗ ERP	-	-	-	-	⊗ ERP
D6. Demolish Bldg. 1156	-	-	-	-	-	-	-
D7. Demolish Bldg. 1155	-	-	-	-	-	-	-
D8. Demolish Bldgs. 180, 181, and 174	-	-	-	-	-	-	-
D9. Demolish Bldg. 702	-	-	-	-	-	-	-
D10. Demolish Bldg. 1104 (CATM)	-	⊗ ERP	-	-	-	-	⊗ ERP
D11. Demolish Bldg. 166 (Evergreen Inn)	-	-	-	-	-	-	-
D12. Demolish Bldg. 551	-	-	-	-	-	-	-

Legend:

- No effects or negligible effects ⊕ Potential minor beneficial effects ⊗ Potential minor adverse effects ■ Potentially significant (greater magnitude than representative projects)

Key:

65 dBA = Within the 65 dBA noise contour
QD = Within or near QD arcs
NPDES = NPDES permit required
CC = Within 300 feet of Clover Creek
FP = Within floodplain
PP = Within ponderosa pine stand
GO = Within Garry oak stand
WG = Near western gray squirrel habitat
WA = Near white-top aster habitat
VC = Vegetation clearing
WE = Effects on wildlife
WT = Within wetlands
DR = Design review required
ERP = Within or near known ERP site
HAZ = Change in quantity or storage for hazardous materials or wastes

Table 4-18. Potential Environmental Consequences from All Proposed Projects Listed in Appendix A (continued)

Project Identification Number and Title	Land Use	Safety	Geological Resources	Water Resources	Biological Resources	Cultural Resources	Hazardous Materials and Wastes
D13. Demolish Bldg. 841 (Headquarters Group)	-	-	-	-	-	-	-
D14. Demolish Bldg. 757 (warehouse)	-	-	-	-	-	-	-
D15. Demolish Bldg. 814 (Ammunition Storage)	-	⊗ QD	-	-	-	-	
D16. Demolish Bldg. 1501 (Communications Facility)	-	-	-	-	-	-	-
D17. Demolish Bldg. 350	-	⊗ QD	-	-	-	-	-
D18. Demolish the Vehicle Lift at Bldg. 774	-	⊗ ERP	-	-	-	-	⊗ ERP

Legend:

- No effects or negligible effects ⊕ Potential minor beneficial effects ⊗ Potential minor adverse effects ■ Potentially significant (greater magnitude than representative projects)

Key:

65 dBA = Within the 65 dBA noise contour
QD = Within or near QD arcs
NPDES = NPDES permit required
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GO = Within Garry oak stand
WG = Near western gray squirrel habitat
WA = Near white-top aster habitat
VC = Vegetation clearing
WE = Effects on wildlife
WT = Within wetlands
DR = Design review required
ERP = Within or near known ERP site
HAZ = Change in quantity or storage for hazardous materials or wastes

Table 4-18. Potential Environmental Consequences from All Proposed Projects Listed in Appendix A (continued)

Project Identification Number and Title	Land Use	Safety	Geological Resources	Water Resources	Biological Resources	Cultural Resources	Hazardous Materials and Wastes
Proposed Construction Projects							
C4. Construct Visiting Quarters (264 rooms)	-	-	⊗ NPDES	⊗ NPDES	- VC, WE	- DR	-
C5. Construct 144-Person Dormitory (Phase 2)	-	-	⊗ NPDES	⊗ NPDES	- VC, WE	-	-
C6. Construct 144-Person Dormitory (Phase 3)	-	-	⊗ NPDES	⊗ NPDES	- VC, WE	-	-
C7. Construct Collocated Chapel and Family Support Center	-	-	⊗ NPDES	⊗ NPDES	- VC, WE	- DR	-
C8. Construct Communications Squadron Facility	-	-	-	-	- VC, WE	-	-
C9. Construct Central Deployment Facility	-	-	-	-	-	-	-
C10. Construct New Fire Station	⊗ 65 dBA	⊗ ERP	-	-	-	-	⊗ ERP
C11. Add to and alter Bldg. 1176 (Vehicle Maintenance Facility)	⊗ 65 dBA	-	-	-	- VC, WE	-	-

Legend:

- No effects or negligible effects ⊕ Potential minor beneficial effects ⊗ Potential minor adverse effects ■ Potentially significant (greater magnitude than representative projects)

Key:

65 dBA = Within the 65 dBA noise contour
QD = Within or near QD arcs
NPDES = NPDES permit required
CC = Within 300 feet of Clover Creek
FP = Within floodplain
PP = Within ponderosa pine stand
GO = Within Garry oak stand
WG = Near western gray squirrel habitat
WA = Near white-top aster habitat
VC = Vegetation clearing
WE = Effects on wildlife
WT = Within wetlands
DR = Design review required
ERP = Within or near known ERP site
HAZ = Change in quantity or storage for hazardous materials or wastes

Table 4-18. Potential Environmental Consequences from All Proposed Projects Listed in Appendix A (continued)

Project Identification Number and Title	Land Use	Safety	Geological Resources	Water Resources	Biological Resources	Cultural Resources	Hazardous Materials and Wastes
C12. Construct 262 IWAS Facility	-	-	-	-	- VC, WE	-	-
C13. Add to and alter Bldg. 743 (Module Replacement Center)	-	-	-	-	-	-	-
C14. Construct Reception Center/Billeting Office	-	-	-	-	- VC, WE	- DR	-
C15. Construct PMEL Facility	-	-	-	-	- VC, WE	- DR	-
C16. Add to Bldg. 1307 (C-17 Flight Simulator Facility)	-	-	-	-	⊗ VC, WE	-	-
C17. Add to Bldg. 774 (Special Purpose Vehicles)	-	⊗ ERP	-	-	-	-	⊗ ERP
C18. Add to Bldg. 691 (ASTs)	-	-	-	-	-- VC, WE	-	-
C19. Construct CATM Facility	-	-	-	-	- VC, WE	-	-
C20. Construct Vehicle Corrosion Control Facility	-	⊗ ERP	-	-	-	-	⊗ ERP

Legend:

- No effects or negligible effects ⊕ Potential minor beneficial effects ⊗ Potential minor adverse effects ■ Potentially significant (greater magnitude than representative projects)

Key:

65 dBA = Within the 65 dBA noise contour
QD = Within or near QD arcs
NPDES = NPDES permit required
CC = Within 300 feet of Clover Creek
FP = Within floodplain
PP = Within ponderosa pine stand
GO = Within Garry oak stand
WG = Near western gray squirrel habitat
WA = Near white-top aster habitat
VC = Vegetation clearing
WE = Effects on wildlife
WT = Within wetlands
DR = Design review required
ERP = Within or near known ERP site
HAZ = Change in quantity or storage for hazardous materials or wastes

Table 4-18. Potential Environmental Consequences from All Proposed Projects Listed in Appendix A (continued)

Project Identification Number and Title	Land Use	Safety	Geological Resources	Water Resources	Biological Resources	Cultural Resources	Hazardous Materials and Wastes
C21. Construct Munitions Administrative Facility	-	⊗ QD	-	-	-	-	-
C22. Construct EOD Facility	⊗ 65 dBA	-	-	-	-- VC, WE	-	-
C23. Expand Mezzanine of Bldg. 304	⊗ 65 dBA	-	-	-	-	-	-
C24. Add to Building 328 (Reserve EOD)	⊗ 65 dBA	-	-	-	- VC, WE	-	-
Proposed Infrastructure Projects							
I4. Repair Taxiway J near Bldg. 1174	-	-	⊗ NPDES	⊗ NPDES	-	-	-
I5. Construct Youth Soccer Complex	-	-	-	-	-	-	-
I6. Install Backup Generator and Add Overhang for Bldg. 21	-	-	-	-	-	-	-
I7. Demolish Various Underground Heating Oil Tanks Basewide *(not shown on figure)*	-	-	-	-	-	-	-

Legend:

- No effects or negligible effects ⊕ Potential minor beneficial effects ⊗ Potential minor adverse effects ■ Potentially significant (greater magnitude than representative projects)

Key:

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QD = Within or near QD arcs
NPDES = NPDES permit required
CC = Within 300 feet of Clover Creek
FP = Within floodplain
PP = Within ponderosa pine stand
GO = Within Garry oak stand
WG = Near western gray squirrel habitat
WA = Near white-top aster habitat
VC = Vegetation clearing
WE = Effects on wildlife
WT = Within wetlands
DR = Design review required
ERP = Within or near known ERP site
HAZ = Change in quantity or storage for hazardous materials or wastes

Table 4-18. Potential Environmental Consequences from All Proposed Projects Listed in Appendix A (continued)

Project Identification Number and Title	Land Use	Safety	Geological Resources	Water Resources	Biological Resources	Cultural Resources	Hazardous Materials and Wastes
I8. Construct Trash Dumpster Enclosures Basewide *(not shown on figure)*	-	-	-	-	-	-	-
I9. Construct Canopy for Bldg. 730	-	-	-	-	-	- DR	-
I10. Remove Septic System and Connect to Sewer System	-	-	-	-	-- VC, WE	-	-
I11. Construct secondary containment around grease dumpsters at Bldgs. 510 (Burger King), 700 (Consolidated Club), 895 (Golf Course Club), and 548 (Olympic Dining Facility)	-	-	-	-	-	-	-
I12. Construct Two Canopies over Building 28 Parking Areas	-	-	-	-	-	-	-
I13. Construct Covered Storage at Bldg. 707 (LAB PME)	-	-	-	-	-	- DR	-
I14. Install Water Main in the 300 Ammunition Area	-	⊗ QD	-	-	- VC, WE	-	-

Legend:

- No effects or negligible effects ⊕ Potential minor beneficial effects ⊗ Potential minor adverse effects ■ Potentially significant (greater magnitude than representative projects)

Key:

65 dBA = Within the 65 dBA noise contour

QD = Within or near QD arcs

NPDES = NPDES permit required

CC = Within 300 feet of Clover Creek

FP = Within floodplain

PP = Within ponderosa pine stand

GO = Within Garry oak stand

WG = Near western gray squirrel habitat

WA = Near white-top aster habitat

VC = Vegetation clearing

WE = Effects on wildlife

WT = Within wetlands

DR = Design review required

ERP = Within or near known ERP site

HAZ = Change in quantity or storage for hazardous materials or wastes

Table 4-18. Potential Environmental Consequences from All Proposed Projects Listed in Appendix A (continued)

Project Identification Number and Title	Land Use	Safety	Geological Resources	Water Resources	Biological Resources	Cultural Resources	Hazardous Materials and Wastes
I15. Construct Fence, Sidewalks, and Concrete Pad at Bldg. 829 (Military Working Dog Kennels)	-	-	-	-	- VC, WE	-	-
I16. Install Water Distribution Main between Buildings 700 and 773	-	-	-	-	- VC, WE	-	-
I17. Relocate Building 190 (East Well)	-	-	-	-	-	-	-
I18. Construct Pavilion for Bldg. 548 (Dining Facility)	-	-	-	-	- VC, WE	-	-
I19. Construct Canopy for Bldg. 757 (Security Forces Squadron Storage)	-	-	-	-	-	- DR	-
I20. Repair Fuel Valves on C-Ramp	-	⊗ ERP	-	-	-	-	⊗ ERP
I21. Replace Street Lighting and Circuits (throughout Historic District)	-	-	-	-	-	- DR	-
I22. Construct Playground at Bldg. 580	-	-	-	-	- VC, WE	-	-

Legend:

- No effects or negligible effects ⊕ Potential minor beneficial effects ⊗ Potential minor adverse effects ■ Potentially significant (greater magnitude than representative projects)

Key:

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NPDES = NPDES permit required
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FP = Within floodplain
PP = Within ponderosa pine stand
GO = Within Garry oak stand
WG = Near western gray squirrel habitat
WA = Near white-top aster habitat
VC = Vegetation clearing
WE = Effects on wildlife
WT = Within wetlands
DR = Design review required
ERP = Within or near known ERP site
HAZ = Change in quantity or storage for hazardous materials or wastes

Table 4-18. Potential Environmental Consequences from All Proposed Projects Listed in Appendix A (continued)

Project Identification Number and Title	Land Use	Safety	Geological Resources	Water Resources	Biological Resources	Cultural Resources	Hazardous Materials and Wastes
I23. Construct Roundabout at Fairway Road and Jackson Boulevard	-	-	⊗ NPDES	⊗ NPDES	- VC, WE	-	-
I24. Construct Drafting Pit for Fire Department	-	⊗ QD	-	-	-	-	-

Legend:

- No effects or negligible effects ⊕ Potential minor beneficial effects ⊗ Potential minor adverse effects ■ Potentially significant (greater magnitude than representative projects)

Key:

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QD = Within or near QD arcs
NPDES = NPDES permit required
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FP = Within floodplain
PP = Within ponderosa pine stand
GO = Within Garry oak stand
WG = Near western gray squirrel habitat
WA = Near white-top aster habitat
VC = Vegetation clearing
WE = Effects on wildlife
WT = Within wetlands
DR = Design review required
ERP = Within or near known ERP site
HAZ = Change in quantity or storage for hazardous materials or wastes

PROJECT ID	PROJECT TITLE
C1.	Construct Physical Fitness Center
C2.	Construct Base Engineering Complex and pavement
C3.	Construct a 144-Person Dormitory (Phase 1)
C4.	Construct Visiting Quarters
C5.	Construct a 144-room dormitory, Phase II
C6.	Construct a 144-room dormitory, Phase III
C7.	Construct Collocated Chapel and Family Support Center
C8.	Construct Communications Squadron Facility
C9.	Construct a Central Deployment Facility
C10.	Construct Fire Station
C11.	Add to and alter Bldg. 1176
C12.	Construct 262 IWAS Facility
C13.	Add to and alter Bldg. 743
C14.	Construct Reception Center/Billeting Office
C15.	Construct PMEL Facility
C16.	Add to Bldg. 1307
C17.	Add to Bldg. 774
C18.	Add to Bldg. 691
C19.	Construct CATM Facility
C20.	Construct a Vehicle Corrosion Control Facility
C21.	Construct Munitions Administrative Facility
C22.	Construct EOD Facility
C23.	Expand the Mezzanine of Bldg. 304
C24.	Add to Bldg. 328
D1.	Demolish Existing Base Engineering Facilities and pavement
D2.	Demolish Visiting Airmen's Quarters
D3.	Demolish Fitness Center and Pool House
D4.	Demolish Bldg. 565 in association with Bldgs. 546, 566, and 567
D5.	Demolish Bldg. 6
D6.	Demolish Bldg. 1156
D7.	Demolish Bldg. 1155
D8.	Demolish Bldgs. 160, 174, and 181
D9.	Demolish Bldg. 702
D10.	Demolish Bldg. 1104
D11.	Demolish Bldg. 166
D12.	Demolish Bldg. 551
D13.	Demolish Bldg. 841
D14.	Demolish Bldg. 757
D15.	Demolish Bldg. 814
D16.	Demolish Bldg. 1501
D17.	Demolish Bldg. 350
D18.	Demolish Bldg. 774
I1.	Repair Portions of Taxiway C
I3.	Replace Bulk Fuel Storage, Distribution Components, and POL Facilities
I4.	Repair Taxiway J near Building 1174
I5.	Construct Youth Soccer Complex
I6.	Install Backup Generator and Add Overhang for Bldg. 21
I9.	Construct a Canopy for Bldg. 730
I10.	Remove Septic System and Connect to the Sewer System
I12.	Construct secondary containment around grease dumpsters at Bldgs. 510 (Burger King), 700 (Consolidated Club), 895 (Golf Course Club), and 548 (Olympic Dining Facility)
I13.	Construct Two Canopies over Bldg. 28 Parking Areas
I14.	Construct Covered Storage at Bldg. 707
I15.	Install Water Main in the Ammunition Area
I16.	Construct Fence, Sidewalks, and a Concrete Pad at Bldg. 829
I17.	Install Water Distribution Main between Bldgs. 700 and 773
I18.	Relocate Bldg. 190 (current location)
I19.	Relocate Bldg. 190
I20.	Construct a Pavilion for Bldg. 548
I21.	Construct a Canopy for Bldg. 757
I22.	Repair Fuel Valves on C-Ramp
I23.	Replace Street Lighting and Circuits (Historic District)
I24.	Construct Playground at Bldg. 580
I25.	Construct Roundabout
	Construct Drafting Pit

Representative Projects
- Construction
- Demolition
- Infrastructure

All Other Projects
- Construction
- Demolition
- Infrastructure
- Infrastructure

McChord AFB Boundary

Constraints
- DNL Noise Contours, with dBA
- Clear Zone
- APZs
- Airfield
- QD Arcs
- ERP Sites
- Historic District
- Wetlands
- 100-Year Floodplain
- Water

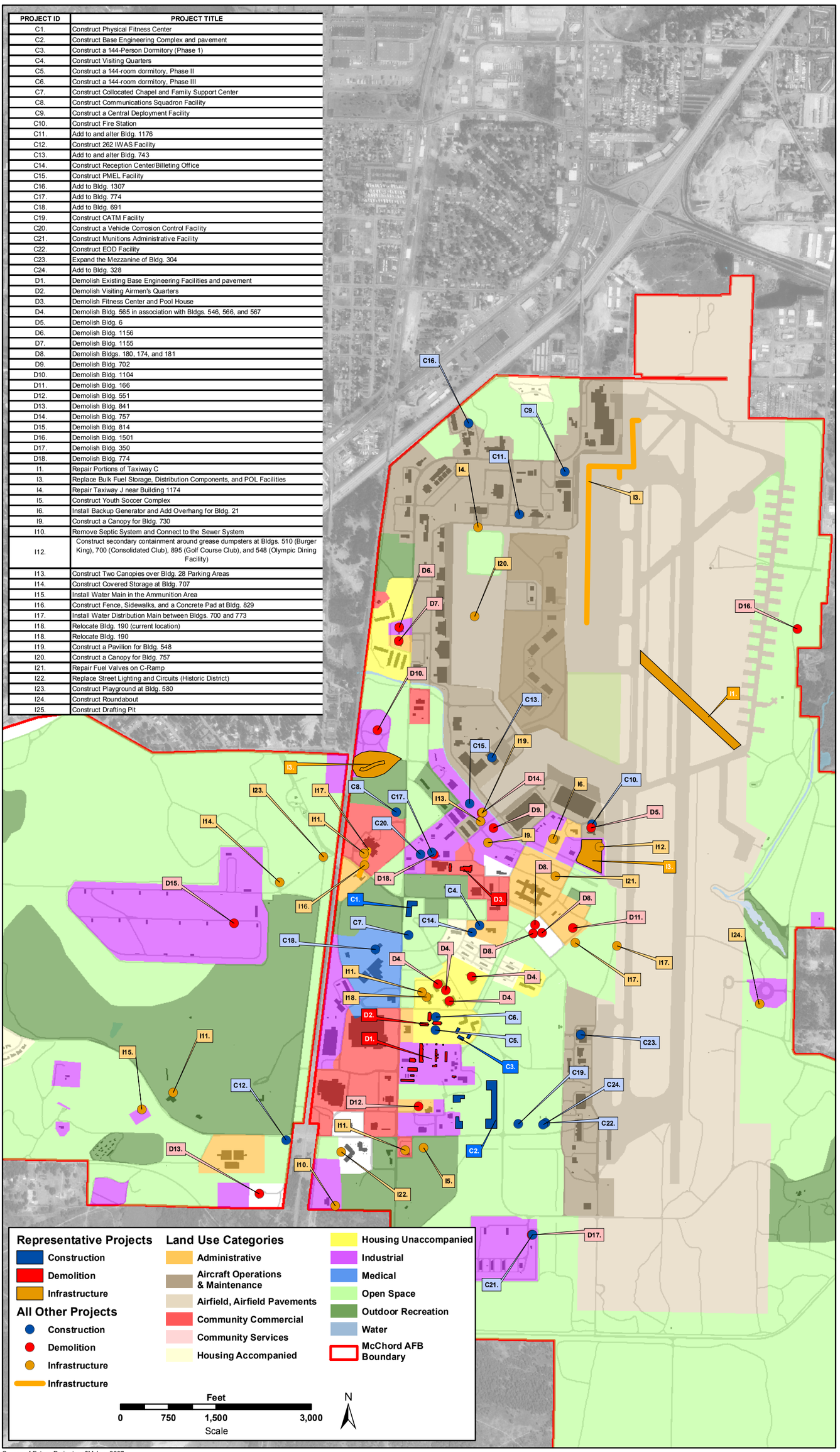
N

Feet
0 750 1,500 3,000
Scale

Source of Future Projects: e2M, Inc. 2007

Figure 4-4. All Proposed Projects Relative to Known Constraints

PROJECT ID	PROJECT TITLE
C1.	Construct Physical Fitness Center
C2.	Construct Base Engineering Complex and pavement
C3.	Construct a 144-Person Dormitory (Phase 1)
C4.	Construct Visiting Quarters
C5.	Construct a 144-room dormitory, Phase II
C6.	Construct a 144-room dormitory, Phase III
C7.	Construct Collocated Chapel and Family Support Center
C8.	Construct Communications Squadron Facility
C9.	Construct a Central Deployment Facility
C10.	Construct Fire Station
C11.	Add to and alter Bldg. 1176
C12.	Construct 262 IWAS Facility
C13.	Add to and alter Bldg. 743
C14.	Construct Reception Center/Billeting Office
C15.	Construct PMEL Facility
C16.	Add to Bldg. 1307
C17.	Add to Bldg. 774
C18.	Add to Bldg. 691
C19.	Construct CATM Facility
C20.	Construct a Vehicle Corrosion Control Facility
C21.	Construct Munitions Administrative Facility
C22.	Construct EOD Facility
C23.	Expand the Mezzanine of Bldg. 304
C24.	Add to Bldg. 328
D1.	Demolish Existing Base Engineering Facilities and pavement
D2.	Demolish Visiting Airmen's Quarters
D3.	Demolish Fitness Center and Pool House
D4.	Demolish Bldg. 565 in association with Bldgs. 546, 566, and 567
D5.	Demolish Bldg. 6
D6.	Demolish Bldg. 1156
D7.	Demolish Bldg. 1155
D8.	Demolish Bldgs. 180, 174, and 181
D9.	Demolish Bldg. 702
D10.	Demolish Bldg. 1104
D11.	Demolish Bldg. 166
D12.	Demolish Bldg. 551
D13.	Demolish Bldg. 841
D14.	Demolish Bldg. 757
D15.	Demolish Bldg. 814
D16.	Demolish Bldg. 1501
D17.	Demolish Bldg. 350
D18.	Demolish Bldg. 774
I1.	Repair Portions of Taxiway C
I3.	Replace Bulk Fuel Storage, Distribution Components, and POL Facilities
I4.	Repair Taxiway J near Building 1174
I5.	Construct Youth Soccer Complex
I6.	Install Backup Generator and Add Overhang for Bldg. 21
I9.	Construct a Canopy for Bldg. 730
I10.	Remove Septic System and Connect to the Sewer System
I12.	Construct secondary containment around grease dumpsters at Bldgs. 510 (Burger King), 700 (Consolidated Club), 895 (Golf Course Club), and 548 (Olympic Dining Facility)
I13.	Construct Two Canopies over Bldg. 28 Parking Areas
I14.	Construct Covered Storage at Bldg. 707
I15.	Install Water Main in the Ammunition Area
I16.	Construct Fence, Sidewalks, and a Concrete Pad at Bldg. 829
I17.	Install Water Distribution Main between Bldgs. 700 and 773
I18.	Relocate Bldg. 190 (current location)
I18.	Relocate Bldg. 190
I19.	Construct a Pavilion for Bldg. 548
I20.	Construct a Canopy for Bldg. 757
I21.	Repair Fuel Valves on C-Ramp
I22.	Replace Street Lighting and Circuits (Historic District)
I23.	Construct Playground at Bldg. 580
I24.	Construct Roundabout
I25.	Construct Drafting Pit



Source of Future Projects: e2M, Inc. 2007

Figure 4-5. All Projects Relative to Land Use

Air Quality. No projects were identified that would result in modifications to existing air permits or increase in long-term air emissions. No project would violate the NAAQS or any other air quality rule or regulation. **Table 4-19** is meant to be an example if all proposed projects were totaled and then divided equally over 5 years at McChord AFB. As shown in **Table 4-19**, if these projects were to be implemented equally over a 5-year period, the proposed emissions would be well below *de minimis* thresholds and 10 percent of the regional emissions threshold for PSIAQCR (USEPA 2006); therefore, USEPA air quality standards and regulations would not be violated.

Table 4-19. Annual Construction, Demolition, and Infrastructure Emissions at McChord AFB

Proposed Project	NO_x (tpy)	VOC (tpy)	CO (tpy)	SO_x (tpy)	PM_{10} (tpy)
Total Emissions	32.354	5.955	46.417	0.866	37.558
Conformity *de minimis* threshold	NA	NA	100	NA	NA
Regional PSIACQR Emissions Inventory	121,986	128,696	1,042,661	8,938	46,166
Percentage of Regional Emissions Inventory (PSIAQCR)	0.0247%	0.0045%	0.0044%	0.0064%	0.0755%

Note: NA = not applicable

Safety. **Table 4-18** identifies several projects with potential safety concerns. Projects that are near or within ERP sites increase the potential for construction workers to encounter contamination. A health and safety officer should be present during groundbreaking activities for these projects. If contamination is encountered, it would be handled, stored, transported, and disposed of in accordance with applicable Federal, state, and local regulation.

Some proposed projects are identified as being within or very near to QD arcs. Munitions transport would not occur during construction activities to minimize construction workers' exposure to explosive safety hazards. When groundbreaking activities occur in areas where munitions are stored or handled, the EOD team should be onsite in the event that UXO is encountered so that it can be disposed of safely. Any project within QD arcs would be coordinated with 62 AW/SEW to ensure the project is carried out in accordance with explosive safety measures.

Geological Resources. Projects that would disturb 1 acre or more of land are identified in **Table 4-18** as requiring a NPDES permit. These projects have the potential to result in adverse effects as result of sedimentation and erosion because of their size, but implementation of BMPs would reduce these kinds of effects. Refer to discussion in **Section 4.3.5**.

Water Resources. Projects that would disturb 1 acre or more of land are identified in **Table 4-18** as requiring a NPDES permit. These projects have the potential to result in adverse effects as result of sedimentation and erosion into water bodies because of their size, but implementation of BMPs would reduce these kinds of effects. Refer to discussion in **Section 4.3.6**.

Implementation of all proposed projects would increase impervious surfaces at McChord AFB by approximately 10 acres. During the engineering and design phase of all construction projects, implementation of erosion and sediment control and storm water BMPs (such as silt fencing, sediment traps, and covering of soil piles during construction and demolition and use of properly designed storm water detention and retention facilities after construction) would minimize the potential adverse effects of the Proposed Action. Refer to discussion in **Section 4.3.6**.

Biological Resources. Most of the proposed installation development projects would occur in disturbed areas of McChord AFB. These projects would result in negligible adverse effects on biological resources at McChord AFB. Refer to discussion in **Section 4.3.7** of potential adverse effects on vegetation and wildlife. Project C16 is proposed near a Garry oak stand and has the potential to affect approximately 0.25 acres of this stand; however, because Project C16 would be near the edge of the stand, it is not expected to fragment the stand.

Cultural Resources. The Proposed Action has no potential to affect archaeological resources. None of the proposed demolition projects (D4–D18) would involve structures that have been determined eligible for listing in the NRHP or structures that are 45 years old or older that would require evaluation for eligibility. Several of the construction and infrastructure projects (C4, C7, C14, C15, I9, I13, I19, and I21) would occur within the McChord Field Historic District or directly involve structures that are contributing elements to the historic district. Given that McChord AFB has a design review process in place to ensure that these projects would be completed in a manner compatible with the construction of structures comprising the historic district, these projects should not impact the historic district. Construction and infrastructure projects adjacent to the historic district (C8, C10, C13, C17, C18, C20, I12, and I18) should also undergo design review to ensure that they would not impact the viewshed of the historic district. The remaining construction and infrastructure projects have no potential to impact architectural resources. No resources of significance to Native American tribes have been identified within McChord AFB to date. As part of its ongoing consultation program, however, McChord AFB will determine the potential of the Proposed Action to impact resources of traditional, religious, or cultural significance to Native American tribes in consultation with interested tribes.

Socioeconomic Resources and Environmental Justice. All proposed projects would be expected to result in direct and indirect short-term minor beneficial effects as a result of construction costs. No long-term effects would be expected.

Infrastructure. Implementation of all proposed projects would be expected to result in long-term beneficial effects on infrastructure systems by providing the required airfield, road, and utilities upgrades to support existing and future missions.

However, demolition, construction, and infrastructure projects would result in adverse effects as a result of increased solid waste generation. As indicated in **Table 4-20**, approximately 189,872 tons would be generated over the next 5 years. Clean demolition and construction debris (e.g., concrete, asphalt) would be ground, recycled, and used for fill and road work rather than disposed of in a landfill to the greatest extent possible.

Hazardous Waste and Materials. Several projects could encounter contamination from ERP sites. As stated previously, McChord AFB manages 65 ERP sites, all of which have no further response action planned or a remedial action underway. Although some sites have no further response action planned, the possibility of encountering contamination could still exist, such as if the remedial action is natural attenuation. Projects C10, C16, C20, D5, D10, D18, I7, and I20 are within the boundaries of ERP sites, some of which are included in the installation's long-term monitoring program. Any proposed project within the ERP sites must be coordinated on an individual basis with the 62 CES/CEV. As with all demolition and construction projects, small quantities of hazardous wastes and materials would be generated or consumed. Operating procedures for handling, storage, and disposal are outlined in several management plans at McChord AFB, such as the Hazardous Waste Management Plan, AMP, and the LBP Management Plan. Contractors performing tasks under the Proposed Action would be required to manage their materials and wastes in accordance with management plans currently in place.

Table 4-20. Anticipated Generation of Construction and Demolition Debris as a Result of All Proposed Projects

Proposed Project	Project Size (ft^2)	Multiplier (pounds/ft^2)	Total Waste Generated	
			Pounds	U.S. Tons
Proposed IDEA Building Demolition [a]	257,060	155	39,844,300	19,922
Proposed IDEA Building Construction [a]	735,390	4.38	3,221,008	1,611
Proposed IDEA Pavement Repair and Demolition [b]	5,171,060	65	336,118,900	168,059
Proposed IDEA Pavement Construction [c]	559,250	1	559,250	280
Total				**189,872**

Sources: [a] USEPA 1998, [b] calculated using standard asphalt density, [c] USACE 1976

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5. Cumulative Effects

Cumulative effects on environmental resources result from incremental effects of proposed actions, when combined with other past, present, and reasonably foreseeable future projects in the area. Cumulative effects can result from individually minor, but collectively substantial, actions undertaken over time by various agencies (Federal, state, and local) or individuals. Informed decision making is served by consideration of cumulative effects resulting from projects that are proposed, under construction, recently completed, or anticipated to be implemented in the reasonably foreseeable future.

This cumulative effects analysis summarizes expected environmental effects from the combined impacts of past, current, and reasonably foreseeable future projects at McChord AFB.

5.1 Projects Identified With the Potential for Cumulative Effects

Several other projects have been identified as past, present, and reasonably foreseeable future actions that, in conjunction with the Proposed Action, have the potential to result in cumulative effects. These projects are summarized below.

BRAC 2005

The BRAC Commission recommended realigning McChord AFB by relocating installation management functions to Fort Lewis, establishing Joint Base Lewis-McChord. It is anticipated that this realignment would result in a reduction of overall manpower and facilities requirements. Specific requirements of this realignment have not been identified, but it could result in a potential reduction of 776 jobs (422 direct and 354 indirect) over the 2006–2011 period in the Tacoma, Washington Metropolitan area (a 0.2 percent loss), assuming no economic recovery (Global Security 2005).

The BRAC Commission also recommended realigning the medical functions at McChord AFB under the Madigan Army Medical Center. This reorganization would occur as directed by the Commander of the Madigan Army Medical Center. It is anticipated that military authorizations would become civilian authorizations, so there could be minor changes in personnel. No facilities construction has been identified associated with the medical facilities realignment. However, specific personnel or facility requirements associated with this project have not been finalized.

The BRAC 2005 recommendations would primarily result in economic effects as a result of the direct and indirect loss of military and civilian authorizations. If facility demolition, construction, and infrastructure projects are identified in the future as a result of joint basing or realigning medical functions, then those projects would be addressed at a later date and are not considered in this cumulative effects analysis.

Privatization of Military Family Housing

Pursuant to the USAF Housing Privatization Program, AMC proposes to convey 980 MFH units to a private developer and lease 315 acres of land at McChord AFB. The private developer would be responsible for the selective demolition of 860 old units, renovation of 30 units for use as temporary lodging, and construction of 293 units for an end-state total of 383 MFH units (the 30 temporary lodging units would not contribute to the end-state total). One alternative has been identified, which is to demolish 708 units, renovate 152 units, and construct 141 units for an end-state total of 383 MFH units (the 30 temporary lodging units do not contribute to the end-state total). It is anticipated that construction activities would last for 18 months, and that demolition activities would occur over a 10-year period. An EA is being prepared for this action. Generally, the environmental effects associated with demolition and construction of military housing units would be similar to those described in this IDEA. Leasing

agreements would not be expected to result in any environmental effects, but could have beneficial indirect economic effects by increasing the housing supply in the local area (MAFB 2005b).

Most of the MFH parcels at McChord AFB are on the western portion of the installation and removed from the installation development projects considered in this IDEA. However, there are two parcels—The Bricks (30 MFH units, 10 acres) and Command Circle (2 military housing units, 5 acres)—that are in the vicinity of the proposed projects considered in this IDEA. Under privatization agreements, the units in The Bricks parcel, which is within the McChord Field Historic District, would be renovated on the interior and converted to temporary lodging facilities. The two units in Command Circle would be demolished, and the proposed future use of that parcel is open space (MAFB 2005b, 62 AW 2005a).

Changes in Aircraft Operations

The 62 AW proposes to add new military aircraft flight tracks and profiles, modify the flight tracks and profiles for closed patterns, conduct landing zone landings, increase the number of airfield operations at McChord AFB, and lower an altitude associated with the Runway 16 Instrument Landing System approach. It is anticipated that these aircraft operations would increase the noise level in the vicinity of McChord AFB. No personnel authorizations would be included with this project. Construction activities would be limited to the installation of landing zone markings and an infrared lighting system for night-vision goggle operations, which would have no to negligible effect on the existing environment. An EA addressing the C-17 basing at McChord AFB was prepared in 1997 (AMC 1997); a Supplemental EA is being prepared to address the changes in aircraft operations (62 AW 2006).

These proposed changes in aircraft operations would result in increased noise and increased air emissions. It is not anticipated that these effects would be significant, but the increased noise contours could result in changes to land use planning both on the installation and off the installation. Therefore, potential cumulative effects on air quality and land use planning are considered in this cumulative effects analysis.

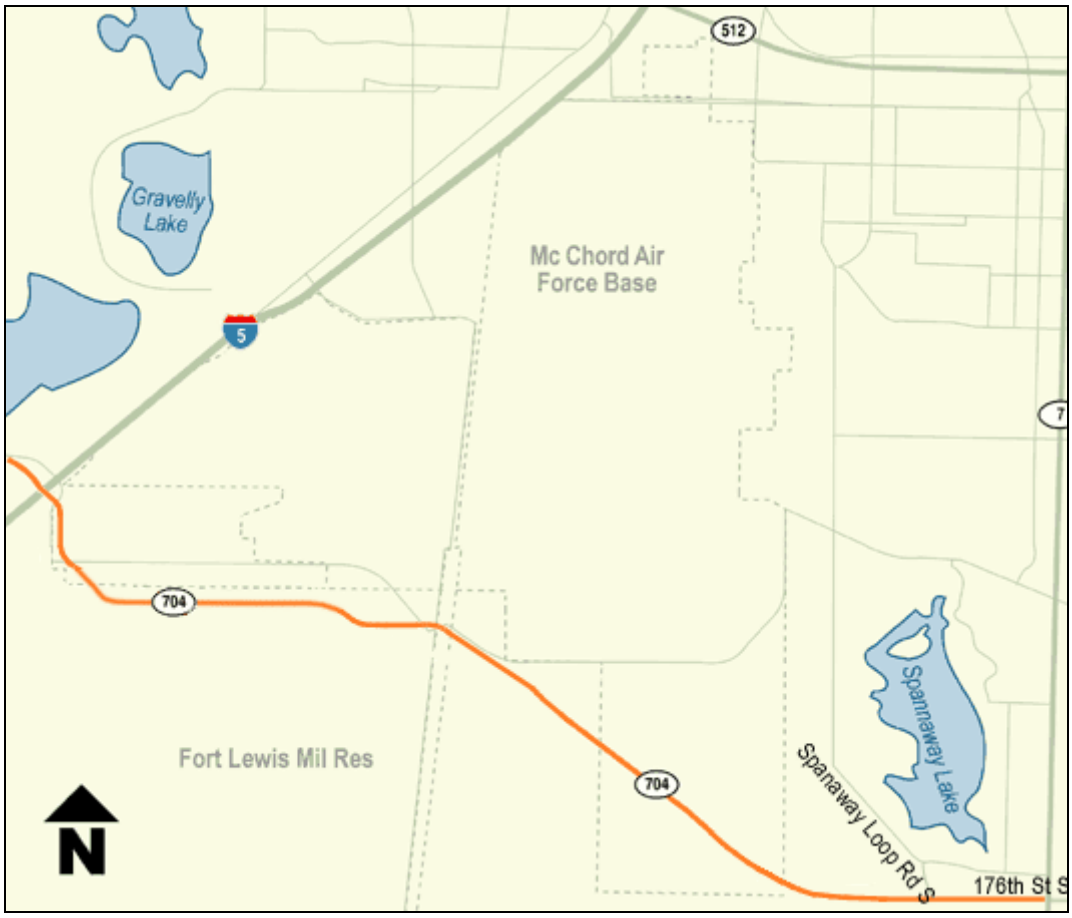
Construction of the Cross-Base Highway (State Route 704)

The Federal Highway Administration (lead agency), the Washington State Department of Transportation, and Pierce County, in cooperation with the City of Lakewood, McChord AFB, and Fort Lewis, propose to develop a new arterial roadway between the Thorne Interchange on I-5 and the intersection of 176th Street and State Route 7 (Pacific Avenue). The new roadway (designated as State Route 704) will provide four through-lanes and will be 5.9 miles long. Access to the roadway would be limited to three signalized intersections and an interchange at A Street providing access to both McChord AFB and Fort Lewis. The planned path of State Route 704 is shown in **Figure 5-1**. An EIS was prepared for this project and completed in September 2003 (FHWA, WSDOT, and PC 2003). The Record of Decision was signed on August 2, 2004 (FHWA 2004). Construction is anticipated to begin in March 2008.

As shown in **Figure 5-1**, the path of State Route 704 would not be near any of the proposed IDEA projects. However, construction of State Route 704 would be occurring concurrent with implementation of the Proposed Action. It is not anticipated that State Route 704 would be operational during the timeframe of the proposed installation development activities.

5.2 Cumulative Effects Analysis

Table 5-1 summarizes potential cumulative effects on resources from the Proposed Action when combined with other past, present, and future activities.



Source: WSDOT 2007

Figure 5-1. Location of the Proposed Cross-Base Highway (State Route 704)

Table 5-1. Cumulative Effects on Resources at McChord AFB

Resource	Past Actions	Current Background Activities	Proposed Action	Known Future Actions	Cumulative Effects
Noise	Aircraft activities and vehicular traffic are the dominant noise sources.	Aircraft activities and vehicular traffic are the dominant noise sources.	Short-term, localized, adverse effects during construction.	Increased noise associated with increased aircraft operations and vehicles from Cross-Base Highway.	Areas of active construction would experience increased noise levels. Increased aircraft operations would increase the overall ambient noise levels. Cumulative effects would not be significant.
Land Use	Past development activities have extensively modified land use.	Uses include airfield, administrative, light industry, commercial, and residential. Uses are generally compatible on-installation.	Demolition and construction activities would promote long-term compatible land uses on the installation.	Increased noise contours associated with increased aircraft operations could affect compatibility on- and off-installation.	Proposed projects C4, C11, C13, C14, C15, C16, C19, C21, C22, and C24 could be within the 65-dBA noise contour as a result of the proposed increased aircraft operations. Therefore, these proposed IDEA projects should incorporate sound attenuation as necessary into construction design if the proposed aircraft operations are implemented.
Air Quality	PSIAQCR is a moderate maintenance area for CO and in attainment for all other criteria pollutants.	Emissions from aircraft, vehicles, and buildings.	Short-term, localized, adverse effects during construction. Long-term minor increases associated with boilers and emergency generators.	Increased emissions associated with increased aircraft operations.	The Cross-Base Highway project has been included in the Regional Transportation Improvement Program, so it has met all air conformity requirements. The other projects considered for cumulative effects would emit an estimated 88 tpy CO, which would not trigger a conformity analysis. Cumulative effects on air quality would not be significant.

Table 5-1. Cumulative Effects on Resources at McChord AFB (continued)

Resource	Past Actions	Current Background Activities	Proposed Action	Known Future Actions	Cumulative Effects
Safety	None.	None.	Short-term increased risk of accident associated with increased construction.	None.	No cumulative effects expected.
Geological Resources	Past development activities have extensively modified soils.	None.	Short-term, localized adverse effects during construction.	Short-term, localized adverse effects during MFH projects.	No cumulative effects expected.
Water Resources	Surface water quality moderately affected by previously development and operational activities.	Pollution from industrial and municipal sources is generally low.	Short-term, localized, adverse effects associated with construction. Long-term adverse effects from increased impervious surfaces.	Short-term, localized adverse effects during MFH project. Long-term adverse effects from increased impervious surfaces.	Demolition of MFH units associated with the privatization initiative would offset increased impervious surfaces associated with proposed IDEA projects. Cumulative effects not significant.
Biological Resources	Past development activities have extensively modified much of the historic and native habitat of sensitive and common wildlife species.	Human presence and operation of facilities impact wildlife and their habitat.	Short-term minor adverse effects from construction noise. Long-term minor adverse effects from loss of habitat.	Short-term minor adverse effects from construction noise. Long-term adverse effects from loss of habitat, particularly wetland and forest habitat from the Cross-Base Highway.	Minor adverse cumulative effects would be expected as a result of habitat removal. The proposed IDEA projects would remove a small portion of habitat. The proposed Cross-Base Highway would remove high-quality habitat. The Proposed Action would not contribute significantly to cumulative effects on biological resources.

Table 5-1. Cumulative Effects on Resources at McChord AFB (continued)

Resource	Past Actions	Current Background Activities	Proposed Action	Known Future Actions	Cumulative Effects
Cultural Resources	Past installation activities have extensively disturbed the ground resulting in possible destruction of unknown artifacts.	None.	Modifications to McChord Field Historic District would be coordinated to ensure no adverse effects.	No effect from BRAC, MFH, or increased aircraft operations. Adverse effects identified from Cross-Base Highway but not on-installation.	No cumulative effects expected.
Socioeconomic Resources and Environmental Justice	McChord AFB and Fort Lewis contribute substantially to the local economy.	Continued support of local economy.	Minor beneficial contribution to local economy from construction costs.	Long-term adverse effects from loss of personnel authorizations associated with BRAC. Long-term beneficial effects associated with increased housing market.	The proposed IDEA projects would have a short-term minor beneficial effect on local economy. McChord AFB and Fort Lewis will continue to contribute substantially to local economy. Cumulative effects not significant.
Infrastructure	Infrastructure has been developed to support McChord AFB operations.	Continual improvements and upgrades as needed.	Short-term adverse effects as a result of construction traffic. Improvements and upgrades to infrastructure systems would enable ongoing and future missions.	Short-term adverse effects as a result of construction traffic. Long-term beneficial effects on traffic as a result of Cross-Base Highway.	All construction activities would increase construction traffic, which would be considered a minor adverse cumulative effect. Cumulative effects not significant.

Table 5-1. Cumulative Effects on Resources at McChord AFB (continued)

Resource	Past Actions	Current Background Activities	Proposed Action	Known Future Actions	Cumulative Effects
Hazardous Materials and Wastes	One of 65 ERP sites is on National Priorities List.	Presence and operation of facilities impact fuel management.	Short-term risk associated with increased use of hazardous materials during construction. Potential to encounter contamination from ERP sites.	Short-term risk associated with increased use of hazardous materials during construction. Potential to encounter contamination from ERP sites.	Quantities and types of hazardous materials and wastes would be managed by existing plans. Cumulative effects not significant.

Sources: Global Security 2005; MAFB 2005b; AMC 1997; 62 AW 2006; FHWA, WSDOT, and PC 2006; and FHWA 2004

5.3 Reasonable and Prudent Measures and Best Management Practices

The Proposed Action would not result in significant adverse effects on the land or the surrounding area. However, BMPs and other minimization measures would be implemented to eliminate or reduce the impacts of adverse effects.

General BMPs that might be included as part of the Proposed Action are summarized as follows:

- Clearing and grubbing would be timed with construction to minimize the exposure of cleared surfaces. Such activities would not be conducted during periods of wet weather. Construction activities would be staged to allow for the stabilization of disturbed soils.
- Fugitive dust-control techniques such as watering and stockpiling would be used to minimize adverse effects. All such techniques would conform with the applicable regulations.
- Soil erosion-control measures, such as soil erosion-control mats, silt fences, straw bales, diversion ditches, riprap channels, water bars, water spreaders, and hardened stream crossings, would be utilized as appropriate.
- Minimize the disturbance of environmental resources and topography by integrating existing vegetation, trees, and topography into site design.
- Where feasible, minimize areas of impervious surface through shared parking, decked or structured parking, increased building height, or other measures as appropriate.
- Provisions would be taken to prevent pollutants from reaching the soil, groundwater, or surface water. During project activities, contractors would be required to perform daily inspections of equipment, maintain appropriate spill-containment materials onsite, and store all fuels and other materials in appropriate containers. Equipment maintenance activities would not be conducted on the construction site.
- Physical barriers and "no trespassing" signs would be placed around the demolition and construction sites to deter children and unauthorized personnel. All construction vehicles and equipment would be locked or otherwise secured when not in use.
- Construction equipment would be used only as necessary during the daylight hours and would be maintained to the manufacture's specifications to minimize noise impacts.

Construction impacts are short-term environmental effects resulting from the process of building the Proposed Action. Construction impacts might involve temporary changes in noise levels, air quality, water quality, land use, and community access.

5.4 Unavoidable Adverse Impacts

Unavoidable adverse impacts would result from implementation of the Proposed Action. None of these impacts would be significant.

Hazardous Materials and Waste. The use of nonrenewable resources is an unavoidable occurrence, although not considered significant. The Proposed Action would require the use of fossil fuels, a nonrenewable natural resource. Energy supplies, although relatively small, would be committed to the Proposed Action or No Action Alternative.

Energy. The use of nonrenewable resources is an unavoidable occurrence, although not considered significant. The Proposed Action would require the use of fossil fuels, a nonrenewable natural resource. Energy supplies, although relatively small, would be committed to the Proposed Action.

5.5 Compatibility of the Proposed Action and Alternatives with the Objectives of Federal, Regional, State, and Local Land Use Plans, Policies, and Controls

The Proposed Action would be consistent with all applicable land use ordinances.

5.6 Relationship Between the Short-term Use of the Environment and Long-term Productivity

Short-term uses of the biophysical components of human environment include direct construction-related disturbances and direct impacts associated with an increase in population and activity that occurs over a period of less than 5 years. Long-term uses of human environment include those impacts occurring over a period of more than 5 years, including permanent resource loss.

The Proposed Action would not result in an intensification of land use in the surrounding area. Development of the Proposed Action would not represent a significant loss of open space. Therefore, it is anticipated that the Proposed Action would not result in any cumulative land use or aesthetic impacts.

5.7 Irreversible and Irretrievable Commitments of Resources

The irreversible environmental changes that would result from implementation of the Proposed Action involve the consumption of material resources, energy resources, land, biological habitat, and human resources. The use of these resources is considered to be permanent.

Irreversible and irretrievable resource commitments are related to the use of nonrenewable resources and the effects that use of these resources will have on future generations. Irreversible effects primarily result from use or destruction of a specific resource that cannot be replaced within a reasonable timeframe (e.g., energy and minerals).

Material Resources. Material resources used for the Proposed Action and alternatives include building materials (for renovation or construction of facilities), concrete and asphalt (for parking lots and roads), and various material supplies (for infrastructure) and would be irreversibly lost. Most of the materials that would be consumed are not in short supply, would not limit other unrelated construction activities, and would not be considered significant.

Energy Resources. No significant impacts would be expected on energy resources used as a result of the Proposed Action; however, any resource consumed would be irretrievably lost. These include petroleum-based products (e.g., as gasoline and diesel), natural gas, and electricity. During construction, gasoline and diesel would be used for the operation of construction vehicles. During operation, gasoline or diesel would be used for the operation of POVs and GOVs. Natural gas and electricity would be used by operational activities. Consumption of these energy resources would not place a significant demand on their availability in the region.

Biological Habitat. The Proposed Action would result in the loss of some vegetation and wildlife habitat as a result of development activities. The areas proposed for development under the Proposed Action are not unique or valuable habitat, so effects would not be significant.

Human Resources. The use of human resources for construction and operation is considered an irretrievable loss, only in that it would preclude such personnel from engaging in other work activities. However, the use of human resources for the Proposed Action and alternatives represent employment opportunities and is considered beneficial.

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APPENDIX A

PROPOSED MCCHORD AFB INSTALLATION DEVELOPMENT PROJECTS

Appendix A

Proposed McChord AFB Installation Development Projects

Table A-1. Proposed Facilities Demolition Projects

Installation Project Number	Project Identification Number and Title	FY	Land Use	Area Removed (ft^2)	Change in Impervious Surface (ft^2)
Representative Demolition Projects					
PQWY 9230011	D1. Demolish 12 facilities (Buildings 529, 533, 535, 536, 537, 538, 540, 541, 561, 562, 563, and 24011) (42,800 ft^2) and pavements (211,700 ft^2) to construct a Base Engineering Complex	2014+	IND	255,500	–255,500
PQWY 0200041	D2. Demolish Building 596 (Visiting Airmen's Quarters) once new 144-person dormitory is constructed	2009	HU	10,700	–5,400
PQWY 0200042	D2. Demolish Building 595 (Visiting Airmen's Quarters) once new 144-person dormitory is constructed	2009	HU	10,700	–5,400
PQWY 0200043	D2. Demolish Building 597 (Visiting Airmen's Quarters) once new 144-person dormitory is constructed	2009	HU	10,700	–5,400
PQWY 9530021	D3. Demolish Buildings 726, 736, and 81201 to construct a new Physical Fitness Center	2008–2013	CC	25,200	–25,200
All Other Demolition Projects					
PQWY 143001	D4. Demolish Buildings 564, 565, 566, and 567 (Dormitories)	2014+	HU	66,000	–66,000
PQWY 073001	D5. Demolish Building 6 (Fire Station)	2014+	AOM	21,200	–21,200
PQWY 060008	D6. Demolish Building 1156	2014+	IND	14,300	–14,300
PQWY 060007	D7. Demolish Building 1155	2014+	ADM	13,800	–13,800
PQWY 083002	D8. Demolish Buildings 180, 181, and 174	2008–2013	CS	12,100	–12,100

Land Use Category Key: ADM = Administrative, AF = Airfield, AOM = Aircraft Operations and Maintenance, CC = Community Commercial, CS = Community Services, HU = Housing Unaccompanied, IND = Industrial, MED = Medical, OR = Outdoor Recreation, OS = Open Space, INF = Infrastructure (crossing multiple land use categories)

Table A-1. Proposed Facilities Demolition Projects (continued)

Installation Project Number	Project Identification Number and Title	FY	Land Use	Area Removed (ft^2)	Change in Impervious Surface (ft^2)
PQWY 070002	D9. Demolish Building 702	2008	IND	5,600	–5,600
PQWY 0200071	D10. Demolish Building 1104 (Combat Arms Training and Maintenance [CATM])	2008	IND	4,600	–4,600
PQWY 060009	D11. Demolish Building 166 (Evergreen Inn)	2007	ADM	4,300	–4,300
PQWY 083002	D12. Demolish Building 551	2008–2013	ADM	3,500	–3,500
PQWY 080003	D13. Demolish Building 841 (Headquarters Group)	2008–2013	CS	3,200	–3,200
PQWY 020012	D14. Demolish Building 757 (warehouse)	2014+	IND	2,600	–410
PQWY 0200021	D15. Demolish Building 814 (ammunition storage)	2014+	IND	2,100	–800
PQWY 980013	D16. Demolish Building 1501 (Communications Facility)	2008	OS	1,600	–1,600
PQWY 053002	D17. Demolish Building 350	2014+	IND	1,000	–1,000
PQWY 050001	D18. Demolish vehicle lift at Building 774	2014+	IND	60	–60
Total (ft^2)				**468,760**	**–449,370**

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Table A-2. Proposed Facilities Construction Projects

Installation Project Number	Project Identification Number and Title	FY	Land Use	Area Constructed (ft^2)	Change in Impervious Surface (ft^2)
Representative Construction Projects					
PQWY 9530021	C1. Construct a Physical Fitness Center	2008–2013	CC	94,200	+94,200
PQWY 9230011	C2. Construct a Base Engineering Complex (grounds facility, maintenance facility, and storage facilities) (74,700 ft^2) and pavements (148,100 ft^2)	2014+	IND	222,800	+222,800
PQWY 083001	C3. Construct a 144-person dormitory (Phase 1)	2014+	HU	57,500	+28,750
All Other Construction Projects					
PQWY 063001	C4. Construct Visiting Quarters (264 rooms)	2014+	HU	105,000	+52,500
PQWY 143001	C5. Construct 144-person dormitory (Phase 2)	2014+	HU	57,500	+28,750
PQWY 143001	C6. Construct 144-person dormitory (Phase 3)	2014+	HU	57,500	+28,750
PQWY 083002	C7. Construct Collocated Chapel and Family Support Center	2008–2013	CS	42,800	+42,800
PQWY 043001	C8. Construct Communications Squadron Facility	2014+	ADM	39,700	+39,700
PQWY 983060	C9. Construct Central Deployment Facility	2014+	AOM	37,000	+37,000
PQWY 073001	C10. Construct New Fire Station	2014+	AOM	30,400	+30,400
PQWY 043010	C11. Add to and alter Building 1176 (Vehicle Maintenance Facility)	2014+	AOM	24,000	+24,000
PQWY 059045	C12. Construct a facility for the 262d Information Warfare Aggressor Squadron (262 IWAS)	2009	ADM	22,900	+22,900
PQWY 043002	C13. Add to and alter Building 743 (Module Replacement Center)	2014+	AOM	15,000	+15,000
PQWY 923003	C14. Construct Reception Center/Billeting Office	2014+	HU	13,000	+13,000

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Table A-2. Proposed Facilities Construction Projects (continued)

Installation Project Number	Project Identification Number and Title	FY	Land Use	Area Constructed (ft^2)	Change in Impervious Surface (ft^2)
PQWY 043004	C15. Construct Precision Measurement Equipment Laboratory (PMEL) Facility	2014+	IND	12,100	+12,100
PQWY 103000	C16. Add to Building 1307 (C-17 Flight Simulator Facility) (9,150 ft^2), including a new access road (approximately 1,200 ft^2)	2009	AOM	10,350	+10,350
PQWY 991002A	C17. Add to Building 774 (special purpose vehicles)	2012	IND	10,000	+10,000
PQWY 079001	C18. Add to Building 691 (aboveground storage tanks) for the 446th Aeromedical Staging Squadron	2008–2013	MED	8,600	+8,600
PQWY 023001	C19. Construct Combat Arms Training Maintenance (CATM) Facility	2014+	IND	8,000	+8,000
PQWY 993003	C20. Construct Vehicle Corrosion Control Facility	2014+	IND	7,400	+7,400
PQWY 053002	C21. Construct New Munitions Administrative Facility on the site of the existing Building 350	2014+	IND	5,500	+5,500
PQWY 021073A	C22. Construct an Explosive Ordnance Disposal (EOD) facility adjacent to Building 328. This project would include site disturbance of approximately 10,000 ft^2 and removal of approximately 34 trees.	2009	OS	4,340	+4,340
PQWY 061034	C23. Expand mezzanine of Building 304	2008	AOM	3,000	+3,000
PQWY 049002	C24. Add to Building 328 (Reserve Explosive Ordnance Disposal [EOD])	2009	OS	1,100	+1,100
Total (ft^2)				**889,690**	**+750,940**

Land Use Category Key: ADM = Administrative, AF = Airfield, AOM = Aircraft Operations and Maintenance, CC = Community Commercial, CS = Community Services, HU = Housing Unaccompanied, IND = Industrial, MED = Medical, OR = Outdoor Recreation, OS = Open Space, INF = Infrastructure (crossing multiple land use categories)

Table A-3. Proposed Infrastructure Projects

Installation Project Number	Project Title	FY	Land Use	Project Size (ft^2)	Change in Impervious Surface (ft^2)
Representative Infrastructure Projects					
PQWY 071011	I1. Repair portions of Taxiway C, including milling top 2 inches and resurfacing the top 2 inches with asphalt cement concrete	2009	AF	2,280,000	0
PQWY 0210251–55 and 0210266–69	I2. Replace overhead electrical distribution with underground distribution (approximately 120,000 linear feet of cable)	2007+	INF	300,000	0
PQWY 083007	I3. Replace bulk fuel storage and distribution components and POL facilities	2009	AF & IND	392,000	0
All Other Infrastructure Projects					
PQWY 071012	I4. Repair Taxiway J near Building 1174, including milling 2 inches of the surface and asphalt cement concrete replacement	2008	AF	2,280,000	0
PQWY 065000	I5. Construct three youth soccer fields and supporting structures	2012	OR	135,000	+1,000
PQWY 021024	I6. Install backup generator and add an overhang (30 feet by 45 feet) for Building 21	2012	ADM	8,800	+1,350
PQWY 030003	I7. Demolish various underground heating oil tanks basewide	2009	INF	7,200	0
PQWY 941049	I8. Construct trash dumpster enclosures basewide	2012	INF	6,500	+6,500
PQWY 021040	I9. Construct a canopy over Building 730 (waste storage tank farm)	2010	IND	6,000	0
PQWY 051703	I10. Remove septic system at the Recycling Center and connect to the sewer system	2012	IND	5,600	0
PQWY 0517022	I11. Construct secondary containment around grease dumpsters at Buildings 510 (Burger King), 700 (Consolidated Club), 895 (Golf Course Club), and 548 (Olympic Dining Facility)	2009	CS	3,500	+3,500

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Table A-3. Proposed Infrastructure Projects (continued)

Installation Project Number	Project Title	FY	Land Use	Project Size (ft^2)	Change in Impervious Surface (ft^2)
PQWY 071008	I12. Construct two canopies over Building 28 parking areas	2010	IND	3,500	0
PQWY 061019	I13. Construct covered storage and fencing with two gates for Building 707 (LAB PME)	2012	IND	3,200	+3,200
PQWY 881006	I14. Install a water main in the 300 ammunition area	2012	IND	2,300	0
PQWY 071001	I15. Construct fence, sidewalks, and a concrete pad for outside storage at Building 829 (Military Working Dog Kennels)	2012	IND	2,000	+2,000
PQWY 061007	I16. Install an 8-inch water distribution main between Buildings 700 and 773 (approximately 800 linear feet)	2012	INF	1,200	0
PQWY 0410063	I17. Relocate Building 190 (East Well) so that it is belowgrade and regrade to comply with 1,000-foot runway clearance	2012	AF & AOM	600	0
PQWY 031062	I18. Construct a pavilion for Building 548 (Dining Facility)	2012	CS	200	+200
PQWY 041004	I19. Construct a canopy at Building 757 (Security Forces Squadron Storage)	2012	IND	200	+200
PQWY 061027	I20. Repair fuel valves on C-Ramp so they are 3 inches below grade	2008	AF	160	0
PQWY 021020	I21. Replace street lighting and circuits in the historical campus of the installation	2008	INF	not applicable	0
PQWY 071020	I22. Construct new playground at Building 580	2007	CS	5,000	0
PQWY 071051	I23. Construct roundabout at Fairway Road and Jackson Boulevard	2007	OS	195,000	+100,000
PQWY 081001	I24. Construct fire department drafting pit in location of existing drafting pit	2008	IND	196,350	0
Total (ft^2)				**3,782,310**	**+117,950**

Land Use Category Key: ADM = Administrative, AF = Airfield, AOM = Aircraft Operations and Maintenance, CC = Community Commercial, CS = Community Services, HU = Housing Unaccompanied, IND = Industrial, MED = Medical, OR = Outdoor Recreation, OS = Open Space, INF = Infrastructure (crossing multiple land use categories)

APPENDIX B

APPLICABLE LAWS, REGULATIONS, POLICIES, AND PLANNING CRITERIA

Appendix B

Applicable Laws, Regulations, Policies, and Planning Criteria

When considering the affected environment, the various physical, biological, economic, and social environmental factors must be considered. In addition to the National Environmental Policy Act (NEPA), there are other environmental laws as well as Executive Orders (EOs) to be considered when preparing environmental analyses. These laws are summarized below.

NOTE: This is not a complete list of all applicable laws, regulations, policies, and planning criteria potentially applicable to documents, however, it does provide a general summary for use as a reference.

Airspace

Airspace management in the USAF is guided by Air Force Instruction (AFI) 13-201, *Air Force Airspace Management*. This AFI provides guidance and procedures for developing and processing special use airspace (SUA). It covers aeronautical matters governing the efficient planning, acquisition, use, and management of airspace required to support USAF flight operations. It applies to activities that have operational or administrative responsibility for using airspace and establishes practices to decrease disturbances from flight operations that might cause adverse public reaction and provides flying unit commanders with general guidance for dealing with local problems.

Noise

The Air Installation Compatible Use Zone (AICUZ) Program, (AFI 32-7063), provides guidance to air bases and local communities in planning land uses compatible with airfield operations. The AICUZ program describes existing aircraft noise and flight safety zones on and near U.S. Air Force (USAF) installations.

Land Use

Land use planning in the USAF is guided by *Land Use Planning Bulletin, Base Comprehensive Planning* (HQ USAF/LEEVX, August 1, 1986). This document provides for the use of 12 basic land use types found on a USAF installation. In addition, land use guidelines established by the U.S. Department of Housing and Urban Development (HUD) and based on findings of the Federal Interagency Committee on Noise (FICON) are used to recommend acceptable levels of noise exposure for land use.

Air Quality

The Clean Air Act (CAA) of 1970, and Amendments of 1977 and 1990, recognizes that increases in air pollution result in danger to public health and welfare. To protect and enhance the quality of the Nation's air resources, the CAA authorizes the U.S. Environmental Protection Agency (USEPA) to set six National Ambient Air Quality Standards (NAAQSs) which regulate carbon monoxide, lead, nitrogen dioxide, ozone, sulfur dioxide, and particulate matter pollution emissions. The CAA seeks to reduce or eliminate the creation of pollutants at their source, and designates this responsibility to state and local governments. States are directed to utilize financial and technical assistance as well as leadership from the Federal government to develop implementation plans to achieve NAAQS. Geographic areas are officially designated by the USEPA as being in attainment or nonattainment to pollutants in relation to their compliance with NAAQS. Geographic regions established for air quality planning purposes are designated as Air Quality Control Regions (AQCR). Pollutant concentration levels are measured at

designated monitoring stations within the AQCR. An area with insufficient monitoring data is designated as unclassifiable. Section 309 of the CAA authorizes USEPA to review and comment on impact statements prepared by other agencies.

An agency should consider what effect an action might have on NAAQS due to short-term increases in air pollution during construction as well as long-term increases resulting from changes in traffic patterns. For actions in attainment areas, a Federal agency could also be subject to USEPA's Prevention of Significant Deterioration (PSD) regulations. These regulations apply to new major stationary sources and modifications to such sources. Although few agency facilities will actually emit pollutants, increases in pollution can result from a change in traffic patterns or volume. Section 118 of the CAA waives Federal immunity from complying with the CAA and states all Federal agencies will comply with all Federal- and state-approved requirements.

The General Conformity Rule requires that any Federal action meet the requirements of a SIP or Federal Implementation Plan. More specifically, CAA conformity is ensured when a Federal action does not cause a new violation of the NAAQS, contribute to an increase in the frequency or severity of violations of NAAQS, or delay the timely attainment of any NAAQS, interim progress milestones, or other milestones toward achieving compliance with the NAAQS.

The General Conformity Rule applies only to actions in nonattainment or maintenance areas and considers both direct and indirect emissions. The rule applies only to Federal actions that are considered "regionally significant" or where the total emissions from the action meet or exceed the *de minimis* thresholds presented in 40 CFR 93.153. An action is regionally significant when the total nonattainment pollutant emissions exceed 10 percent of the AQCR's total emissions inventory for that nonattainment pollutant. If a Federal action does not meet or exceed the *de mimimis* thresholds and is not considered regionally significant, then a full Conformity Determination is not required.

Safety

AFI 91-202, *USAF Mishap Prevention Program*, implements Air Force Policy Directive (AFPD) 91-2, *Safety Programs*. It establishes mishap prevention program requirements (including the Bird/Wildlife Aircraft Strike Hazard [BASH] Program), assigns responsibilities for program elements, and contains program management information. This instruction applies to all USAF personnel.

AFI 91-301, *Air Force Occupational and Environmental Safety, Fire Protection, and Health (AFOSH) Program,* implements AFPD 91-3, *Occupational Safety and Health,* by outlining the AFOSH Program. The purpose of the AFOSH Program is to minimize loss of USAF resources and to protect USAF personnel from occupational deaths, injuries, or illnesses by managing risks. In conjunction with the USAF Mishap Prevention Program, these standards ensure all USAF workplaces meet Federal safety and health requirements. This instruction applies to all USAF activities.

Geological Resources

Recognizing that millions of acres per year of prime farmland are lost to development, Congress passed the Farmland Protection Policy Act to minimize the extent to which Federal programs contribute to the unnecessary and irreversible conversion of farmland (7 CFR Part 658). Prime farmland are soils that have a combination of soil and landscape properties that make them highly suitable for cropland, such as high inherent fertility, good water-holding capacity, deep or thick effective rooting zones, and are not subject to periodic flooding. Under the Farmland Protection Policy Act, agencies are encouraged to conserve prime or unique farmlands when alternatives are practicable. Some activities that are not subject to the Farmland Protection Policy Act include Federal permitting and licensing, projects on land already

in urban development or used for water storage, construction for national defense purposes, or construction of new minor secondary structures such as a garage or storage shed.

Water Resources

The Clean Water Act (CWA) of 1977 is an amendment to the Federal Water Pollution Control Act of 1972, is administered by USEPA, and sets the basic structure for regulating discharges of pollutants into U.S. waters. The CWA requires USEPA to establish water quality standards for specified contaminants in surface waters and forbids the discharge of pollutants from a point source into navigable waters without a National Pollutant Discharge Elimination System (NPDES) permit. NPDES permits are issued by USEPA or the appropriate state if it has assumed responsibility. Section 404 of the CWA establishes a Federal program to regulate the discharge of dredge and fill material into waters of the United States. Section 404 permits are issued by the U.S. Army Corps of Engineers (USACE). Waters of the United States include interstate and intrastate lakes, rivers, streams, and wetlands that are used for commerce, recreation, industry, sources of fish, and other purposes. The objective of the CWA is to restore and maintain the chemical, physical, and biological integrity of the Nation's waters. Each agency should consider the impact on water quality from actions such as the discharge of dredge or fill material into U.S. waters from construction, or the discharge of pollutants as a result of facility occupation.

Section 303(d) of the CWA requires states and USEPA to identify waters not meeting state water-quality standards and to develop Total Maximum Daily Loads (TMDLs). A TMDL is the maximum amount of a pollutant that a waterbody can receive and still be in compliance with state water-quality standards. After determining TMDLs for impaired waters, states are required to identify all point and nonpoint sources of pollution in a watershed that are contributing to the impairment and to develop an implementation plan that will allocate reductions to each source to meet the state standards. The TMDL program is currently the Nation's most comprehensive attempt to restore and improve water quality. The TMDL program does not explicitly require the protection of riparian areas. However, implementation of the TMDL plans typically calls for restoration of riparian areas as one of the required management measures for achieving reductions in nonpoint source pollutant loadings.

The Coastal Zone Management Act (CZMA) of 1972 declares a national policy to preserve, protect, and develop, and, where possible, restore or enhance the resources of the Nation's coastal zone. The coastal zone refers to the coastal waters and the adjacent shorelines including islands, transitional and intertidal areas, salt marshes, wetlands, and beaches, and includes the Great Lakes. The CZMA encourages states to exercise their full authority over the coastal zone, through the development of land and water use programs in cooperation with Federal and local governments. States may apply for grants to help develop and implement management programs to achieve wise use of the land and water resources of the coastal zone. Development projects affecting land or water use or natural resources of a coastal zone, must ensure the project is, to the maximum extent practicable, consistent with the state's coastal zone management program.

The Safe Drinking Water Act (SDWA) of 1974 establishes a Federal program to monitor and increase the safety of all commercially and publicly supplied drinking water. Congress amended the SDWA in 1986, mandating dramatic changes in nationwide safeguards for drinking water and establishing new Federal enforcement responsibility on the part of USEPA. The 1986 amendments to the SDWA require USEPA to establish Maximum Contaminant Levels (MCLs), Maximum Contaminant Level Goals (MCLGs), and Best Available Technology (BAT) treatment techniques for organic, inorganic, radioactive, and microbial contaminants; and turbidity. MCLGs are maximum concentrations below which no negative human health effects are known to exist. The 1996 amendments set current Federal MCLs, MCLGs, and BATs for organic, inorganic, microbiological, and radiological contaminants in public drinking water supplies.

The Wild and Scenic Rivers Act of 1968 provides for a wild and scenic river system by recognizing the remarkable values of specific rivers of the Nation. These selected rivers and their immediate environment are preserved in a free-flowing condition, without dams or other construction. The policy not only protects the water quality of the selected rivers but also provides for the enjoyment of present and future generations. Any river in a free-flowing condition is eligible for inclusion, and can be authorized as such by an Act of Congress, an act of state legislature, or by the Secretary of the Interior upon the recommendation of the governor of the state(s) through which the river flows.

EO 11988, *Floodplain Management* (May 24, 1977), directs agencies to consider alternatives to avoid adverse effects and incompatible development in floodplains. An agency may locate a facility in a floodplain if the head of the agency finds there is no practicable alternative. If it is found there is no practicable alternative, the agency must minimize potential harm to the floodplain, and circulate a notice explaining why the action is to be located in the floodplain prior to taking action. Finally, new construction in a floodplain must apply accepted floodproofing and flood protection to include elevating structures above the base flood level rather than filling in land.

Biological Resources

The Endangered Species Act (ESA) of 1973 establishes a Federal program to conserve, protect, and restore threatened and endangered plants and animals and their habitats. The ESA specifically charges Federal agencies with the responsibility of using their authority to conserve threatened and endangered species. All Federal agencies must ensure any action they authorize, fund, or carry out is not likely to jeopardize the continued existence of an endangered or threatened species or result in the destruction of critical habitat for these species, unless the agency has been granted an exemption. The Secretary of the Interior, using the best available scientific data, determines which species are officially endangered or threatened, and the U.S. Fish and Wildlife Service (USFWS) maintains the list. A list of Federal endangered species can be obtained from the Endangered Species Division, USFWS (703-358-2171). States might also have their own lists of threatened and endangered species which can be obtained by calling the appropriate State Fish and Wildlife office. Some species, such as the bald eagle, also have laws specifically for their protection (e.g., Bald Eagle Protection Act).

The Migratory Bird Treaty Act (MBTA) of 1918, as amended, implements treaties and conventions between the United States, Canada, Japan, Mexico, and the former Soviet Union for the protection of migratory birds. Unless otherwise permitted by regulations, the MBTA makes it unlawful to pursue, hunt, take, capture, or kill; attempt to take, capture or kill; possess, offer to or sell, barter, purchase, deliver, or cause to be shipped, exported, imported, transported, carried, or received any migratory bird, part, nest, egg, or product, manufactured or not. The MBTA also makes it unlawful to ship, transport or carry from one state, territory, or district to another, or through a foreign country, any bird, part, nest, or egg that was captured, killed, taken, shipped, transported, or carried contrary to the laws from where it was obtained; and import from Canada any bird, part, nest, or egg obtained contrary to the laws of the province from which it was obtained. The U.S. Department of the Interior has authority to arrest, with or without a warrant, a person violating the MBTA.

EO 11514, *Protection and Enhancement of Environmental Quality* (March 5, 1970), states that the President, with assistance from the Council on Environmental Quality (CEQ), will lead a national effort to provide leadership in protecting and enhancing the environment for the purpose of sustaining and enriching human life. Federal agencies are directed to meet national environmental goals through their policies, programs, and plans. Agencies should also continually monitor and evaluate their activities to protect and enhance the quality of the environment. Consistent with NEPA, agencies are directed to share information about existing or potential environmental problems with all interested parties, including the public, in order to obtain their views.

EO 11990, *Protection of Wetlands* (May 24, 1977), directs agencies to consider alternatives to avoid adverse effects and incompatible development in wetlands. Federal agencies are to avoid new construction in wetlands, unless the agency finds there is no practicable alternative to construction in the wetland, and the proposed construction incorporates all possible measures to limit harm to the wetland. Agencies should use economic and environmental data, agency mission statements, and any other pertinent information when deciding whether or not to build in wetlands. EO 11990 directs each agency to provide for early public review of plans for construction in wetlands.

EO 13186, *Conservation of Migratory Birds* (January 10, 2001), creates a more comprehensive strategy for the conservation of migratory birds by the Federal government. EO 13186 provides a specific framework for the Federal government's compliance with its treaty obligations to Canada, Mexico, Russia, and Japan. EO 13186 provides broad guidelines on conservation responsibilities and requires the development of more detailed guidance in a Memorandum of Understanding (MOU). EO 13186 will be coordinated and implemented by the USFWS. The MOU will outline how Federal agencies will promote conservation of migratory birds. EO 13186 requires the support of various conservation planning efforts already in progress; incorporation of bird conservation considerations into agency planning, including NEPA analyses; and reporting annually on the level of take of migratory birds.

Cultural Resources

The American Indian Religious Freedom Act of 1978 and Amendments of 1994 recognize that freedom of religion for all people is an inherent right, and traditional American Indian religions are an indispensable and irreplaceable part of Indian life. It also recognized the lack of Federal policy on this issue and made it the policy of the United States to protect and preserve the inherent right of religious freedom for Native Americans. The 1994 Amendments provide clear legal protection for the religious use of peyote cactus as a religious sacrament. Federal agencies are responsible for evaluating their actions and policies to determine if changes should be made to protect and preserve the religious cultural rights and practices of Native Americans. These evaluations must be made in consultation with native traditional religious leaders.

The Archaeological Resource Protection Act (ARPA) of 1979 protects archaeological resources on public and American Indian lands. It provides felony-level penalties for the unauthorized excavation, removal, damage, alteration, or defacement of any archaeological resource, defined as material remains of past human life or activities which are at least 100 years old. Before archaeological resources are excavated or removed from public lands, the Federal land manager must issue a permit detailing the time, scope, location, and specific purpose of the proposed work. ARPA also fosters the exchange of information about archaeological resources between governmental agencies, the professional archaeological community, and private individuals. ARPA is implemented by regulations found in 43 CFR Part 7.

The National Historic Preservation Act (NHPA) of 1966 sets forth national policy to identify and preserve properties of state, local, and national significance. The NHPA establishes the Advisory Council on Historic Preservation (ACHP), State Historic Preservation Officers (SHPOs), and the National Register of Historic Places (NRHP). ACHP advises the President, Congress, and Federal agencies on historic preservation issues. Section 106 of the NHPA directs Federal agencies to take into account effects of their undertakings (actions and authorizations) on properties included in or eligible for the NRHP. Section 110 sets inventory, nomination, protection, and preservation responsibilities for federally owned cultural properties. Section 106 of the act is implemented by regulations of the ACHP, 36 CFR Part 800. Agencies should coordinate studies and documents prepared under Section 106 with NEPA where appropriate. However, NEPA and NHPA are separate statutes and compliance with one does not constitute compliance with the other. For example, actions which qualify for a categorical exclusion under NEPA might still require Section 106 review under NHPA. It is the responsibility of the agency

official to identify properties in the area of potential effects, and whether they are included or eligible for inclusion in the NRHP. Section 110 of the NHPA requires Federal agencies to identify, evaluate, and nominate historic property under agency control to the NRHP.

The Native American Graves Protection and Repatriation Act (NAGPRA) of 1990 establishes rights of American Indian tribes to claim ownership of certain "cultural items," defined as Native American human remains, funerary objects, sacred objects, and objects of cultural patrimony, held or controlled by Federal agencies. Cultural items discovered on Federal or tribal lands are, in order of primacy, the property of lineal descendants, if these can be determined, and then the tribe owning the land where the items were discovered or the tribe with the closest cultural affiliation with the items. Discoveries of cultural items on Federal or tribal land must be reported to the appropriate American Indian tribe and the Federal agency with jurisdiction over the land. If the discovery is made as a result of a land use, activity in the area must stop and the items must be protected pending the outcome of consultation with the affiliated tribe.

EO 11593, *Protection and Enhancement of the Cultural Environment* (May 13, 1971), directs the Federal government to provide leadership in the preservation, restoration, and maintenance of the historic and cultural environment. Federal agencies are required to locate and evaluate all Federal sites under their jurisdiction or control which might qualify for listing on the NRHP. Agencies must allow the ACHP to comment on the alteration, demolition, sale, or transfer of property which is likely to meet the criteria for listing as determined by the Secretary of the Interior in consultation with the SHPO. Agencies must also initiate procedures to maintain federally owned sites listed on the NRHP.

EO 13007, *Indian Sacred Sites* (May 24, 1996), provides that agencies managing Federal lands, to the extent practicable, permitted by law, and not inconsistent with agency functions, shall accommodate American Indian religious practitioners' access to and ceremonial use of American Indian sacred sites, shall avoid adversely affecting the physical integrity of such sites, and shall maintain the confidentiality of such sites. Federal agencies are responsible for informing tribes of proposed actions that could restrict future access to or ceremonial use of, or adversely affect the physical integrity of, sacred sites.

EO 13287, *Preserve America* (March 3, 2003), orders Federal agencies to take a leadership role in protection, enhancement, and contemporary use of historic properties owned by the Federal government, and promote intergovernmental cooperation and partnerships for preservation and use of historic properties. EO 13287 established new accountability for agencies with respect to inventories and stewardship.

Socioeconomics and Environmental Justice

EO 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations* (February 11, 1994), directs Federal agencies to make achieving environmental justice part of their mission. Agencies must identify and address the adverse human health or environmental effects that its activities have on minority and low-income populations, and develop agencywide environmental justice strategies. The strategy must list "programs, policies, planning and public participation processes, enforcement, and/or rulemakings related to human health or the environment that should be revised to promote enforcement of all health and environmental statutes in areas with minority populations and low-income populations, ensure greater public participation, improve research and data collection relating to the health of and environment of minority populations and low-income populations, and identify differential patterns of consumption of natural resources among minority populations and low-income populations." A copy of the strategy and progress reports must be provided to the Federal Working Group on Environmental Justice. Responsibility for compliance with EO 12898 is with each Federal agency.

Hazardous Materials and Waste

The Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) of 1980 authorizes USEPA to respond to spills and other releases of hazardous substances to the environment, and authorizes the National Oil and Hazardous Substances Pollution Contingency Plan. CERCLA also provides a Federal "Superfund" to respond to emergencies immediately. Although the "Superfund" provides funds for cleanup of sites where potentially responsible parties cannot be identified, USEPA is authorized to recover funds through damages collected from responsible parties. This funding process places the economic burden for cleanup on polluters.

The Pollution Prevention Act (PPA) of 1990 encourages manufacturers to avoid the generation of pollution by modifying equipment and processes, redesigning products, substituting raw materials, and making improvements in management techniques, training, and inventory control. Consistent with pollution prevention principles, EO 13423, *Strengthening Federal Environmental, Energy, and Transportation Management* (January 24, 2007 [revoking EO 13148]) sets a goal for all Federal agencies that promotes environmental practices, including acquisition of biobased, environmentally preferable, energy-efficient, water-efficient, and recycled-content products, and use of paper of at least 30 percent post-consumer fiber content. In addition, EO 13423 sets a goal that requires Federal agencies to ensure that they reduce the quantity of toxic and hazardous chemicals and materials acquired, used, or disposed of, increase diversion of solid waste as appropriate, and maintain cost effective waste prevention and recycling programs in their facilities. Additionally, in *Federal Register* Volume 58 Number 18 (January 29, 1993), CEQ provides guidance to Federal agencies on how to "incorporate pollution prevention principles, techniques, and mechanisms into their planning and decision making processes and to evaluate and report those efforts, as appropriate, in documents pursuant to NEPA."

The Resource Conservation and Recovery Act (RCRA) of 1976 is an amendment to the Solid Waste Disposal Act. RCRA authorizes USEPA to provide for "cradle-to-grave" management of hazardous waste and sets a framework for the management of nonhazardous municipal solid waste. Under RCRA, hazardous waste is controlled from generation to disposal through tracking and permitting systems, and restrictions and controls on the placement of waste on or into the land. Under RCRA, a waste is defined as hazardous if it is ignitable, corrosive, reactive, toxic, or listed by USEPA as being hazardous. With the Hazardous and Solid Waste Amendments (HSWA) of 1984, Congress targeted stricter standards for waste disposal and encouraged pollution prevention by prohibiting the land disposal of particular wastes. The HSWA amendments strengthen control of both hazardous and nonhazardous waste and emphasize the prevention of pollution of groundwater.

The Superfund Amendments and Reauthorization Act (SARA) of 1986 mandates strong clean-up standards and authorizes USEPA to use a variety of incentives to encourage settlements. Title III of SARA authorizes the Emergency Planning and Community Right to Know Act (EPCRA), which requires facility operators with "hazardous substances" or "extremely hazardous substances" to prepare comprehensive emergency plans and to report accidental releases. If a Federal agency acquires a contaminated site, it can be held liable for cleanup as the property owner/operator. A Federal agency can also incur liability if it leases a property, as the courts have found lessees liable as "owners." However, if the agency exercises due diligence by conducting a Phase I Environmental Site Assessment, it can claim the "innocent purchaser" defense under CERCLA. According to Title 42 United States Code (U.S.C.) 9601(35), the current owner/operator must show it undertook "all appropriate inquiry into the previous ownership and uses of the property consistent with good commercial or customary practice" before buying the property to use this defense.

The Toxic Substance Control Act (TSCA) of 1976 consists of four titles. Title I established requirements and authorities to identify and control toxic chemical hazards to human health and the environment.

TSCA authorized USEPA to gather information on chemical risks, require companies to test chemicals for toxic effects, and regulate chemicals with unreasonable risk. TSCA also singled out polychlorinated biphenyls (PCBs) for regulation, and, as a result, PCBs are being phased out. PCBs are persistent when released into the environment and accumulate in the tissues of living organisms. They have been shown to cause adverse health effects on laboratory animals and could cause adverse health effects in humans. TSCA and its regulations govern the manufacture, processing, distribution, use, marking, storage, disposal, clean-up, and release reporting requirements for numerous chemicals like PCBs. TSCA Title II provides statutory framework for "Asbestos Hazard Emergency Response," which applies only to schools. TSCA Title III, "Indoor Radon Abatement," states indoor air in buildings of the United States should be as free of radon as the outside ambient air. Federal agencies are required to conduct studies on the extent of radon contamination in buildings they own. TSCA Title IV, "Lead Exposure Reduction," directs Federal agencies to "conduct a comprehensive program to promote safe, effective, and affordable monitoring, detection, and abatement of lead-based paint and other lead exposure hazards." Further, any Federal agency having jurisdiction over a property or facility must comply with all Federal, state, interstate, and local requirements concerning lead-based paint.

APPENDIX C

INTERAGENCY COORDINATION AND PUBLIC INVOLVEMENT

Environmental Assessment of Installation Development at McChord Air Force Base, Washington

Interagency and Intergovernmental Coordination for Environmental Planning List

Federal Agencies

Ken Berg, Manager
Western Washington Office
North Pacific Coast Ecoregion
U.S. Fish and Wildlife Service
510 Desmond Drive SE, Suite 102
Lacey, WA 98503

Christine Reichgott
NEPA Review Unit
Office of Ecosystems, Tribal & Public Affairs
USEPA, Region 10
1200 Sixth Ave.
Seattle, WA 98101-3188

Pat Walsh
Environmental Engineer
Federal Aviation Administration
1601 Lind Ave., SW
Renton, WA 98055

Phil Crawford
Public Works
Attn: AFZH-PW Mail Stop 17
Fort Lewis, WA 98433

State Agencies

Dr. Allyson Brooks
State Historic Preservation Officer
Office of Archeology and Historic Preservation
P.O. Box 48343
Olympia, WA 98504-8343

Barbara Ritchie
SEPA Unit Supervisor
Washington Department of Ecology
P.O. Box 47703
Olympia, WA 98504-7703

Dr. Jeffrey P. Koenings, Director
Washington Department of Fish and Wildlife
600 Capitol Way, North
Olympia, WA 98501-1091

Sue Patnude, Regional Director
Washington Dept of Fish and Wildlife, Region 6
48 Devonshire Road
Montesano, WA 98563

Stu Trefry
Puget Sound Regional Manager
Washington State Conservation Commission
P.O. Box 47721
Olympia, WA 98504-7721

Doug Sutherland
Commissioner of Public Lands
Washington Department of Natural Resources
P.O. Box 47001
Olympia, WA 98504-7001

Regional and Local Agencies

Pierce County Board of County Commissioners
City-County Building
930 Tacoma Ave., South
Tacoma, WA 98402-2102

Mayor, City of Lakewood
6000 Main Street, SW
Lakewood, WA 98499-5027

Chuck Kleeberg, Director
Pierce County Planning and Land Services
2401 S. 34th Street
Tacoma, WA 98409

David Bugher
Assistant City Manager for Development
City of Lakewood
6000 Main Street SW
Lakewood, WA 98499-5027

County Executive (Pierce County)
930 Tacoma Avenue South, Room 737
Tacoma, WA 98402-2102

City of Tacoma
Office of the City Manager
747 Market Street
Tacoma, WA 98402-3768

Tacoma Pierce County Health Department
3629 South D Street
Tacoma, WA 98418-6813

Brian J. Ziegler, P.E., Director
Pierce County Public Works & Utilities
2702 South 42nd Street, Suite 201
Tacoma, WA 98409-7322

Don Wickstrom, Director
City of Lakewood Public Works Department
6000 Main Street, SW
Lakewood, WA 98499-5027

Joe Tyo, Director of Environmental Services
Clover Park School District No. 400
10903 Gravelly Lake Drive, SW
Lakewood, WA 98499

Dr. Loren J. Anderson
Office of the President
Pacific Lutheran University
Tacoma, WA 98447-0003

Superintendent
Bethel School District No. 403
516 176th Street, East
Spanaway, WA 98387-8399

Superintendent
Tacoma School District No. 10
601 South 8th Street
Tacoma, WA 98405

Superintendent
Franklin Pierce School District
315 129th Street, South
Tacoma, WA 98444

Tribal Contacts

Chairperson
Nisqually Indian Tribe
4820 She-Nah-Num Drive, SE
Olympia, WA 98503

Chairperson
Puyallup Indian Tribe
2002 East 28th Street
Tacoma, WA 98404-4996

Organizations

Linda Smith, Executive Director
Lakewood Chamber of Commerce
4650 Steilacoom Blvd SW
Bldg 19, Suite 109
Tacoma, WA 98499

Tacoma-Pierce County Chamber of Commerce
P.O. Box 1933
Tacoma, WA 98401-1933

David Anderson
Tillicum/Woodbrook Neighborhood Assoc.
14506 Portland Ave. SW
Lakewood, WA 98498

Mick Frame
Springbrook Neighborhood Association
CenterForce
5204 Solberg Drive, SW
Lakewood, WA 98499-3368

Libraries

Pierce County Library Lakewood Branch
6300 Wildaire Road SW
Lakewood, WA 98499

Tillicum Branch Library
14916 Washington Ave SW
Lakewood, WA 98498

Pierce County Library Parkland-Spanaway Branch
13718 Pacific Avenue South
Tacoma, WA 98444

Base Library
851 Lincoln Blvd, Building 851,
McChord AFB, WA 98438

DEPARTMENT OF THE AIR FORCE
HEADQUARTERS AIR MOBILITY COMMAND

MEMORANDUM FOR SEE DISTRIBUTION

MAY 2 9 2007

FROM: HQ AMC/A7P
507 Symington Drive
Scott AFB, IL 62225-5022

SUBJECT: Description of Proposed Action and Alternatives (DOPAA) for an Installation Development Environmental Assessment (IDEA) at McChord Air Force Base (AFB), Washington

The 62nd Airlift Wing at McChord AFB, Washington, and Headquarters Air Mobility Command (AMC) believe a comprehensive U.S. Air Force Environmental Impact Analysis Process document would improve base planning and streamline our National Environmental Policy Act compliance process. The attached Description of Proposed Action and Alternatives (DOPAA) has been prepared to describe proposed installation development actions found in the community of all existing wing-approved plans for McChord AFB over the next 5 years. This action would enable McChord AFB to meet installation development requirements and ensure readiness for future national defense missions.

The projects to be analyzed in the Installation Development Environmental Assessment or "IDEA" fall into three general categories: facilities demolition projects; facilities construction projects, including new construction, renovations, alterations and repairs; infrastructure projects. Once the IDEA has been prepared, you will have the opportunity to review a draft of the full analysis at that time.

In accordance with Executive Order 12372, *Intergovernmental Review of Federal Programs*, we request your participation in and solicit comments on the attached DOPAA for the IDEA. Comments also may include any issues or concerns related to the IDEA. Please provide your comments or any information by mail to Mr. Mike Grenko, 62 CES/CEV, 174 Tuskegee Boulevard SE, McChord AFB, WA 98438-1326, no later than 30 days from the date of this letter. Mr. Grenko can also be contacted at (253) 982-6201 or by e-mail to mike.grenko@mcchord.af.mil.

Also enclosed is a copy of the distribution list for those federal, state, and local agencies to be contacted regarding this IDEA. If you consider any additional agencies should review and comment on this proposal, please feel free to include them in a re-distribution of the letter and attachments.

If members of your organization have questions about our Interagency/Intergovernmental Coordination for Environmental Planning (IICEP) on this DOPAA, please call our AMC point-of-contact, Mr. Mark Fetzer, HQ AMC/A7PC, at (618) 229-0843, or e-mail to mark.fetzer.ctr@scott.af.mil.

FRANK GINES, Colonel, USAFR
Acting Chief, Plans & Programs Division
Directorate of Installations & Mission Support

2 Attachments:
1. DOPAA
2. DISTRIBUTION: (listed on next page)

AMC--Global Reach For America

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City of Lakewood

June 18, 2007

Mr. Michael Grenko
62 CES/CEV
174 Tuskegee Blvd. SE
McChord AFB, WA 98438-1326

Dear Mr. Grenko:

This letter is in response to the Description of Proposed Action and Alternatives for an Installation Development Environmental Assessment for McChord AFB ("Plan").

Before commenting on the Plan, we must clarify what this document is intended to constitute. The title sounds like what, in state-level environmental review nomenclature, would be the equivalent of an environmental scoping document for an environmental impact statement. The cover sheet/abstract states that "an [environmental assessment] will be prepared" and that it "will be made available to the public for comments during development and upon completion," and there are several statements made in the document about forthcoming work. Yet the cover sheet also designates the report itself as an EA, and the report itself sets forth a preferred and other alternatives, including no action. For the purposes of these comments, we have assumed that this document is intended to assist with scoping and that further analysis and review/comment opportunity is forthcoming. If we have misunderstood, please help us to understand the correct nature of this document.

Environmental justice aspects. Thank you for including representatives of the neighborhoods nearest McChord's gates in this document's distribution. This not only helps to inform the community about what is being planned, but also connects with the least economically empowered portion of not only Lakewood but Pierce County overall. We encourage continued notification of these neighborhoods as projects under this Plan commence.

It is unclear whether the Plan considers pending joint basing. Among the stated goals of collectively analyzing all appropriate projects in a single EA is to eliminate project fractionation and segmentation, facilitate coordination of land-use planning, and provide cost savings, as well as an overarching goal of supporting future mission requirements. Toward that end, it would seem prudent to evaluate the future projects included under this Plan in the context of joint basing and consider such aspects as redundancies or heightened need resulting from or related to joint basing, which will have occurred by the time many, if not all, of the individual projects are to be undertaken.

6000 Main Street SW • Lakewood, WA 98499-5027 • (253) 589-2489 • Fax: (253) 589-3774
www.cityoflakewood.us

Noise contours. Fig.2-2 shows noise contours associated with the base. It is not clear whether these represent the "existing" noise contours (as expressed in 1998 AICUZ Study) or modified noise contours as expressed in the 2006 EA for "Aircraft Operations Changes at McChord Air Force Base, Washington." It is our understanding that additional environmental review work is being conducted relating to the latter and no final documentation has been issued or action taken. This Plan should only represent noise contours that are in place.

Demolition and replacement projects. Environmental analysis should encompass asbestos disposal and spill/leakage remediation if applicable (principally with regard to structural demolition and fuel storage replacement).

Impervious surface/stormwater. Table 2.4 shows some eight acres of additional impervious surface. Runoff generation and retention should be explored in future documentation.

Potential of land acquisition. Section 2.2.1, Alternative 1 – Acquire Additional Land Surrounding McChord AFB, states that "The DOD discourages installations from acquiring more land through purchases. In fact, the DOD is attempting to dispose of as many acres as possible of underutilized land at many installations in the United States." Because of this, this alternative has been eliminated at this level. However, before dismissing this possibility, we encourage McChord to consider the value of land acquisition in relationship to Clear Zone encroachment issues. Since the CZ is discussed within the document and the base is currently working to pair federal REPI money with state/local funds to acquire some CZ land outside the base, perhaps the end document could be modified to briefly discuss this as a separate action from the projects included under the Plan. By doing so, any future efforts toward CZ acquisition will not be incongruent with documentation related to this Plan. In other words, leave the door open. This is consistent with USAF Instruction 32-7063 (September 2005) which states "The Installation CE should acquire a real property interest in fee or through appropriate restrictive easements over all land within the clear zones whenever practicable. …The only real property interests to be acquired are those necessary to prevent incompatible land use, or to prohibit uses generating increased incompatibility (e.g. increased density, increased structure height, etc) in the clear zone… ."

Traffic generation. Is demolition, disposal, and/or construction under the Plan expected to generate additional trips and, if so, will they be directed to the Main Gate or to the South Gate? As stated in the City's comments (copy enclosed) on the draft EA relative to "Anti-Terrorism/Force Protection at Base Motor Vehicle Traffic Gates," (August 2003) the topic of impact on traffic volumes, LOS and/or facilities at the I-5/Murray Road northbound and southbound ramps was not explored. Additionally, the City's concerns about impacts to pavement management impacts on local streets serving the South gate and potential safety impacts to children and vehicles associated with Woodbrook Middle School went unanswered. If construction vehicles are to be continuously directed to the South Gate over the six+-year period of this Plan, this analysis should be included in future documentation.

Technical corrections.

Footnote 3, bottom of p. 2-5: In McChord's case, the entirety of APZ II and all but a very small portion of APZ I falls outside installation boundaries. The notation could be amended to state that almost all of the area extends beyond installation boundaries.

Distribution List: Please note that Dave Bugher's new title is Assistant City Manager for Development. Bill Larkin has not been the City's Public Works Director for some time; the correct name is Don Wickstrom. Also, please ensure that the Mayor's address is corrected. This still shows our old city hall address.

This concludes our comments; thank you for considering them as part of your Plan. Please place me on the mailing list for any subsequent notices related to this Plan or projects thereunder. If you have any questions or need additional information, please contact me at 253.983.7770 or e-mail <djohnson@cityoflakewood.us>.

Sincerely,

Deborah Johnson
Senior Planner
Community Development Dept.

August 27, 2003

Mr. Bud McKay
62 AW/PA
100 Main Street, Suite 1050
McChord AFB, WA 98438-1109

Dear Mr. McKay:

This letter is in response to the draft Environmental Assessment (EA) relative to "Anti-Terrorism/Force Protection at Base Motor Vehicle Traffic Gates" ("Project"). It is intended to provide comments on the draft EA.

Technical corrections. On page 2-6, the No Action alternative appears as a second paragraph under the 2.4.5, South Gate for Commercial Access (with Cross-Base Highway) option. It should be numbered separately as 2.4.6 and titled appropriately. The Table of Contents should be amended accordingly.

Page 2-9, paragraph following Table 2-2: Remove placeholder for next section ("No Action Alternative") at end.

Page 4-9, 4.4.3, Cumulative Impacts: It appears that this text was imported from a different document relative to Travis AFB. Change references from Travis to McChord.

Page 4-16, 4.7.4, No-Action Alternative: There is a placeholder at the end of this section for "Cumulative Impacts." This should be inserted as a new section head numbered separately as 4.7.3; and 4.7.3, Mitigation on the following page should be renumbered as 4.7.4. The Table of Contents should be amended accordingly.

McChord AFB Distribution List following page Appendix B-2: Please correct our department director's name; it should be "Bugher," not "Bugler." Also, we are no longer at the Gravelly Lake Dr. SW address. The address that is shown for Public Works Director Bill Larkin is correct and should be used for our department as well.

Inadequate information is provided to assess the evaluation of proposed development. The draft EA indicates that approximately four acres of oak forest near Bridgeport Way would be cleared to make way for development of a new visitors' center and associated facilities under the Proposed Action (4.4.1, page 4-7). However, the description of impacts to vegetation is expressed in terms of Forest Management Stand numbers, and no figure showing these stands is included in the document. Therefore, it is not possible to assess whether there are off-site concerns related to the proposed clearing. Additionally, a rather cryptic statement, "The loss of open space is not considered irreversible," is contained on page 4-20 (4.11.3). It is unclear how this loss of open space is not irreversible when it is to be developed with a public facility.

It is unclear whether the Project poses potential for capital or other impacts to state and/or federal facilities in the area of the South Gate. A primary element of the Proposed Action would redirect all commercial traffic from the North Gate to the South Gate. No exploration of impact on traffic volumes, LOS and/or facilities at the I-5/Murray Road northbound and southbound ramps is included in the EA. From the Distribution List included in the document, it does not appear the draft EA was even forwarded to WSDOT for review.

Additionally, it does not appear the draft EA was forwarded to Ft. Lewis for review; while the Project "will require use of [Ft. Lewis] property at the new South Gate" and "coordination with [Ft. Lewis] would be required for road improvements on the Government-owned portions of 150th Street SW and Perimeter Road" (page 1-5).

It is unclear whether the Project poses potential for capital impacts to local streets in the area of the South Gate. The draft EA indicates that "Local roadways are adequate to accommodate the additional commercial traffic that would access the Base via the proposed South Gate" (page 2, Draft Finding of No Significant Impact) and "Based on observations of 150th Street SW traffic conditions conducted in 2003, no new vehicle types would be added to the traffic on the street and the roadways are sufficient to accommodate medium and heavy duty vehicles" (page 4-15). However, the draft EA does not explore whether the added volume of medium and heavy vehicles would serve to deteriorate local roadways sooner than would be the case if the additional volume was not present. If so, this may pose added impacts to the City of Lakewood in terms of pavement management costs.

Traffic volume is expressed in such a way as to discount impact. The draft EA assesses traffic increases relative to the Proposed Action by vehicles per day, not trips. It is realistic to assume that the 148 vehicles per day (Table 4-5, page 4-15) estimated to be added through American Lake Gardens would actually represent 296 trips through local, state, and Ft. Lewis facilities, unless commercial vehicles entering through that gate may and are likely to exit through other gates (which is not clear from the description in the draft EA).

It is unclear whether the Project poses potential for impacts to school users in the area of the South Gate. Woodbrook Middle School is located near the entrance to American Lake Gardens. The draft EA does not explore whether the added volume of medium and heavy vehicles would pose safety impacts to children walking or bicycling to/from school or turning and/or peak volume conflicts with school buses or private vehicles delivering children to/from school. It does not appear the draft EA was forwarded to Clover Park School District for review.

Environmental justice considerations relative to the Project appear to have been inadequate. The draft EA states that, under Executive Order 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations*, you must "identify any disproportionately adverse affects to human health or the environment" in the neighborhood of the Project (page 1-6). This goes on to surmise that

"disproportionately adverse effects to minority and low-income populations are [not] anticipated" with implementation of the Proposed Action, specifically stating that this determination is based on "the analysis performed for this EA" (page 1-6; reiterated on page 3 of Draft Finding of No Significant Impact). However, a careful review of the draft EA did not reveal any such analysis. Making such a finding is inappropriate lacking any apparent analysis.

The City of Lakewood has had experience with low-income housing advocacy organizations relative to the American Lake Gardens neighborhood, specifically in relationship to its own comprehensive plan and future redirection of a significant portion of that area to industrial redevelopment. (While zoning has been applied to facilitate such redevelopment, the area remains predominantly residential; an appeal of the City's comprehensive plan by these groups is still pending.) Owing to low property values reinforced by a lack of public services (principally sewers), American Lake Gardens is believed to have a significant low-income population. Woodbrook Middle School has a free/reduced lunch rate of over 60 percent (Source: *Woodbrook Middle School 2001-2002 Annual Performance Report*)

* Redirection of commercial traffic to the South Gate would add, according to the draft EA, approximately 148 medium and heavy vehicles (and correspondingly, 296 new trips) per day to American Lake Gardens' streets, which have neither sidewalks nor bike lanes. No apparent evaluation was made of the impact of this traffic, either in terms of bike/ped safety or noise and exhaust emanating from large vehicles, may have on the disproportionately low-income neighborhood through which it will be directed. We strongly recommend that you to expand the analysis in the draft EA to evaluate this aspect.

Thank you for considering these comments as part of your Project. Please place me on the mailing list for any subsequent notices related to this Project. If you have any questions or need additional information, please contact me at 253.983.7770 or e-mail <djohnson@ci.lakewood.wa.us>.

Sincerely,

Deborah Johnson
Senior Planner
Community Development Dept.

TACOMA-PIERCE COUNTY CHAMBER

POWER THROUGH CONNECTIONS

June 26, 2007

Mr. Mike Grenko
62 CES/CEV
174 Tuskegee Boulevard SE
McChord AFB, WA 98438-1326

RE: DOPAA for IDEA at McChord AFB

Dear Mr. Grenko:

Thank you for the opportunity to comment upon the proposed action and alternatives for McChord AFB as titled above.

In considering this reply and potential future actions, please note that our Chamber addresses areas of interest to our members about our community for both the City of Tacoma and Pierce County. Of particular interest to you may be that our Chamber contains a Chamber Division for the Parkland-Spanaway-Frederickson area of eastern Pierce County, proximate to the eastern boundaries of McChord AFB.

Our Chamber has a long history in association with McChord AFB that can be traced back to involvement in our community's action in donating Tacoma Field to the Department of Defense for the air installation. As a continuation of that long association, we work to maintain and enhance our cooperative relationship with McChord AFB, and appreciate this opportunity to further that cooperation.

The Chamber commends the action of McChord AFB and AMC in presenting this opportunity for the community to fully appreciate and understand the capital facilities plan of the installation. I have read the documentation provided and do not have further comments upon it.

Thank you for this opportunity.

Sincerely,

Gary D. Brackett, CCR
Manager, Business and Trade Development

950 Pacific Avenue • Suite 300 • PO Box 1933 • Tacoma, WA 98401 • P 253.627.2175 • F 253.597.7305 • www.tacomachamber.org

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APPENDIX D

EXAMPLE OF AIR QUALITY EMISSIONS CALCULATIONS

Summary	Summarizes total emissions by calendar year.
Combustion	Estimates emissions from non-road equipment exhaust as well as painting.
Fugitive	Estimates fine particulate emissions from earthmoving, vehicle traffic, and windblown dust
Grading	Estimates the number of days of site preparation, to be used for estimating heavy equipment exhaust and earthmoving dust emissions
AQCR Tier Report	Summarizes total emissions for the Puget Sound Intrastate AQCR Tier Reports for 2001, to be used to compare project to regional emissions.

Emissions from Proposed Action

		NO_x (ton)	VOC (ton)	CO (ton)	SO_2 (ton)	PM_{10} (ton)
CY2009	Construction Combustion	1.698	0.502	1.968	0.051	0.057
	Construction Fugitive Dust	0.000	0.000	0.000	0.000	2.625
	TOTAL CY2009	1.698	0.502	1.968	0.051	2.683

Since future year budgets were not readily available, actual 2001 air emissions inventories for the counties were used as an approximation of the regional inventory. Because the Proposed Action is several orders of magnitude below significance, the conclusion would be the same, regardless of whether future year budget data set were used.

Puget Sound Intrastate AQCR

	Point and Area Sources Combined				
Year	NO_x (tpy)	VOC (tpy)	CO (tpy)	SO_2 (tpy)	PM_{10} (tpy)
2001	131,002	133,440	1,066,357	13,428	49,743

Source: USEPA-AirData NET Tier Report (http://www.epa.gov/air/data/geosel.html). Site visited on 21 June 2007.

Determination Significance (Significance Threshold = 10%)

	Point and Area Sources Combined				
	NO_x (tpy)	VOC (tpy)	CO (tpy)	SO_2 (tpy)	PM_{10} (tpy)
Minimum - 2001	131,002	133,440	1,066,357	13,428	49,743
CY2009 Emissions	1.698	0.502	1.968	0.051	2.683
Proposed Action %	**0.0013%**	**0.0004%**	**0.0002%**	**0.0004%**	**0.0054%**

Combustion Emissions for CY 2009

Combustion Emissions of VOC, NO_x, SO_2, CO and PM_{10} Due to Construction

Includes:

100% of Construct Physical Fitness Center	94,200	ft²	2.16	acres
\				
Total Building Construction Area:	94,200	ft²		
Total Demolished Area:	0	ft²	(None)	
Total Paved Area:	0	ft²	(None)	
Total Disturbed Area:	94,200	ft²		
Construction Duration:	1.0	year(s)		
Annual Construction Activity:	230	days/yr		

Emission Factors Used for Construction Equipment

Reference: Guide to Air Quality Assessment, SMAQMD, 2004

Emission factors are taken from Table 3-2. Assumptions regarding the type and number of equipment are from Table 3-1 unless otherwise noted.

Grading

Equipment	No. Reqd.[a] per 10 acres	NO_x (lb/day)	VOC[b] (lb/day)	CO (lb/day)	SO_2[c]	PM_{10} (lb/day)
Bulldozer	1	29.40	3.66	25.09	0.59	1.17
Motor Grader	1	10.22	1.76	14.98	0.20	0.28
Water Truck	1	20.89	3.60	30.62	0.42	0.58
Total per 10 acres of activity	3	60.51	9.02	70.69	1.21	2.03

Paving

Equipment	No. Reqd.[a] per 10 acres	NO_x (lb/day)	VOC[b] (lb/day)	CO (lb/day)	SO_2[c]	PM_{10} (lb/day)
Paver	1	7.93	1.37	11.62	0.16	0.22
Roller	1	5.01	0.86	7.34	0.10	0.14
Total per 10 acres of activity	2	12.94	2.23	18.96	0.26	0.36

Demolition

Equipment	No. Reqd.[a] per 10 acres	NO_x (lb/day)	VOC[b] (lb/day)	CO (lb/day)	SO_2[c]	PM_{10} (lb/day)
Loader	1	7.86	1.35	11.52	0.16	0.22
Haul Truck	1	20.89	3.60	30.62	0.42	0.58
Total per 10 acres of activity	2	28.75	4.95	42.14	0.58	0.80

Building Construction

Equipment[d]	No. Reqd.[a] per 10 acres	NO_x (lb/day)	VOC[b] (lb/day)	CO (lb/day)	SO_2[c]	PM_{10} (lb/day)
Stationary						
Generator Set	1	11.83	1.47	10.09	0.24	0.47
Industrial Saw	1	17.02	2.12	14.52	0.34	0.68
Welder	1	4.48	0.56	3.83	0.09	0.18
Mobile (non-road)						
Truck	1	20.89	3.60	30.62	0.84	0.58
Forklift	1	4.57	0.79	6.70	0.18	0.13
Crane	1	8.37	1.44	12.27	0.33	0.23
Total per 10 acres of activity	6	67.16	9.98	78.03	2.02	2.27

Note: Footnotes for tables are on following page

Architectural Coatings

Equipment	No. Reqd.[a] per 10 acres	NO_x (lb/day)	VOC[b] (lb/day)	CO (lb/day)	SO_2[c]	PM_{10} (lb/day)
Air Compressor	1	6.83	0.85	5.82	0.14	0.27
Total per 10 acres of activity	1	6.83	0.85	5.82	0.14	0.27

a) The SMAQMD 2004 guidance suggests a default equipment fleet for each activitiy, assuming 10 acres of that activity, (e.g., 10 acres of grading, 10 acres of paving, etc.). The default equipment fleet is increased for each 10 acre increment in the size of the construction project. That is, a 26 acre project would round to 30 acres and the fleet size would be three times the default fleet for a 10 acre project.

b) The SMAQMD 2004 reference lists emission factors for reactive organic gas (ROG). For the purposes of this worksheet ROG = VOC.

c) The SMAQMD 2004 reference does not provide SO_2 emission factors. For this worksheet, SO_2 emissions have been estimated based on approximate fuel use rate for diesel equipment and the assumption of 500 ppm sulfur diesel fuel. For the average of the equipment fleet, the resulting SO_2 factor was found to be approximately 0.04 times the NOx emission factor for the mobile equipment (based upon 2002 USAF IERA "Air Emissions Inventory Guidance") and 0.02 times the NOx emission factor for all other equipment (based on AP-42, Table 3.4-1)

d) Typical equipment fleet for building construction was not itemized in SMAQMD 2004 guidance. The equipment list above was assumed based on SMAQMD 1994 guidance.

PROJECT-SPECIFIC EMISSION FACTOR SUMMARY

Source	Equipment Multiplier*	SMAQMD Emission Factors (lb/day)				
		NO_x	VOC	CO	SO_2**	PM_{10}
Grading Equipment	1	13.085	1.951	15.287	0.262	0.439
Paving Equipment	1	0.000	0.000	0.000	0.000	0.000
Demolition Equipment	1	0.000	0.000	0.000	0.000	0.000
Building Construction	1	14.524	2.158	16.874	0.437	0.491
Air Compressor for Architectural Coating	1	1.477	0.184	1.259	0.030	0.058
Architectural Coating**			25.014			

*The equipment multiplier is an integer that represents units of 10 acres for purposes of estimating the number of equipment required for the project

**Emission factor is from the evaporation of solvents during painting, per "Air Quality Thresholds of Significance", SMAQMD, 1994

Example: SMAQMD Emission Factor for Grading Equipment NOx = (Total Grading NOx per 10 ac*((total disturbed area/43560)/10))*(Equipment Multiplier)

Summary of Input Parameters

	Total Area (ft^2)	Total Area (acres)	Total Days	
Grading:	94,200	2.16	2	(from "CY2009 Grading" worksheet)
Paving:	0	0.00	0	
Demolition:	0	0.00	0	
Building Construction:	94,200	2.16	230	
Architectural Coating	94,200	2.16	20	(per SMAQMD "Air Quality of Thresholds of Significance", 1994)

NOTE: The 'Total Days' estimate for paving is calculated by dividing the total number of acres by 0.21 acres/day, which is a factor derived from the 2005 MEANS Heavy Construction Cost Data, 19th Edition, for 'Asphaltic Concrete Pavement, Lots and Driveways - 6" stone base', which provides an estimate of square feet paved per day. There is also an estimate for 'Plain Cement Concrete Pavement', however the estimate for asphalt is used because it is more conservative. The 'Total 'Days' estimate for demolition is calculated by dividing the total number of acres by 0.02 acres/day, which is a factor also derived from the 2005 MEANS reference. This is calculated by averaging the demolition estimates from 'Building Demolition - Small Buildings, Concrete', assuming a height of 30 feet for a two-story building; from 'Building Footings and Foundations Demolition - 6" Thick, Plain Concrete'; and from 'Demolish, Remove Pavement and Curb - Concrete to 6" thick, rod reinforced'. Paving is double-weighted since projects typically involve more paving demolition. The 'Total Days' estimate for building construction is assumed to be 230 days, unless project-specific data is known.

Total Project Emissions by Activity (lbs)

	NO_x	VOC	CO	SO_2	PM_{10}
Grading Equipment	26.17	3.90	30.57	0.52	0.88
Paving	-	-	-	-	-
Demolition	-	-	-	-	-
Building Construction	3,340.42	496.39	3,881.08	100.46	112.91
Architectural Coatings	29.54	503.96	25.17	0.59	1.17
Total Emissions (lbs):	**3,396.13**	**1,004.25**	**3,936.82**	**101.58**	**114.95**

Results: Total Project Annual Emission Rates

	NO_x	VOC	CO	SO_2	PM_{10}
Total Project Emissions (lbs)	3,396.13	1,004.25	3,936.82	101.58	114.95
Total Project Emissions (tons)	1.6981	0.5021	1.9684	0.0508	0.0575

Fugitive Dust Emissions for CY 2009

Calculation of PM_{10} Emissions Due to Site Preparation (Uncontrolled).

User Input Parameters / Assumptions

Acres graded per year:	2.16	acres/yr	(From "CY2009 Combustion" worksheet)
Grading days/yr:	1.21	days/yr	(From "CY2009 Grading worksheet)
Exposed days/yr:	90	assumed days/yr graded area is exposed	
Grading Hours/day:	8	hr/day	
Soil piles area fraction:	0.10	(assumed fraction of site area covered by soil piles)	
Soil percent silt, s:	8.5	%	(mean silt content; expected range: 0.56 to 23, AP-42 Table 13.2.2-1)
Soil percent moisture, M:	15	%	(http://www.cpc.noaa.gov/products/soilmst/w.shtml)
Annual rainfall days, p:	180	days/yr rainfall exceeds 0.01 inch/day (AP-42 Fig 13.2.2-1)	
Wind speed > 12 mph %, I:	15	%	Ave. of wind speed at Olympia, WA (ftp://ftp.wcc.nrcs.usda.gov/downloads/climate/windrose/washington/olympia)
Fraction of TSP, J:	0.5	per California Environmental Quality Act (CEQA) Air Quality Handbook, SCAQMD, 1993, p. A9-99	
Mean vehicle speed, S:	5	mi/hr	(On-site)
Dozer path width:	8	ft	
Qty construction vehicles:	3.00	vehicles	(From "CY2009 Grading worksheet)
On-site VMT/vehicle/day:	5	mi/veh/day	(Excluding bulldozer VMT during grading)
PM_{10} Adjustment Factor k	1.5	lb/VMT	(AP-42 Table 13.2.2-2 12/03 for PM_{10} for unpaved roads)
PM_{10} Adjustment Factor a	0.9	(dimensionless)	(AP-42 Table 13.2.2-2 12/03 for PM_{10} for unpaved roads)
PM_{10} Adjustment Factor b	0.45	(dimensionless)	(AP-42 Table 13.2.2-2 12/03 for PM_{10} for unpaved roads)
Mean Vehicle Weight W	40	tons	assumed for aggregate trucks

TSP - Total Suspended Particulate
VMT - Vehicle Miles Traveled

Emissions Due to Soil Disturbance Activities

Operation Parameters (Calculated from User Inputs)

Grading duration per acre	4.5	hr/acre	
Bulldozer mileage per acre	1	VMT/acre	(Miles traveled by bulldozer during grading)
Construction VMT per day	15	VMT/day	
Construction VMT per acre	8.4	VMT/acre	(Travel on unpaved surfaces within site)

Equations Used (Corrected for PM_{10})

Operation	Empirical Equation	Units	AP-42 Section (5th Edition)
Bulldozing	$0.75(s^{1.5})/(M^{1.4})$	lbs/hr	Table 11.9-1, Overburden
Grading	$(0.60)(0.051)s^{2.0}$	lbs/VMT	Table 11.9-1,
Vehicle Traffic (unpaved roads)	$[(k(s/12)^{a} (W/3)^{b})]\ [(365-P)/365]$	lbs/VMT	Section 13.2.2

Source: Compilation of Air Pollutant Emission Factors, Vol. I, USEPA AP-42, Section 11.9 dated 10/98 and Section 13.2 dated 12/03

Calculation of PM_{10} Emission Factors for Each Operation

Operation	Emission Factor (mass/ unit)	Operation Parameter	Emission Factor (lbs/ acre)
Bulldozing	0.42 lbs/hr	4.5 hr/acre	1.90 lbs/acre
Grading	0.77 lbs/VMT	1 VMT/acre	0.80 lbs/acre
Vehicle Traffic (unpaved roads)	1.79 lbs/VMT	8.4 VMT/acre	15.00 lbs/acre

Emissions Due to Wind Erosion of Soil Piles and Exposed Graded Surface

Reference: California Environmental Quality Act (CEQA) Air Quality Handbook, SCAQMD, 1993.

Soil Piles EF = 1.7(s/1.5)[(365 - p)/235](I/15)(J) = (s)(365 - p)(I)(J)/(3110.2941), p. A9-99.

Soil Piles EF = 3.8 lbs/day/acre covered by soil piles

Consider soil piles area fraction so that EF applies to graded area

Soil piles area fraction: 0.10 (Fraction of site area covered by soil piles)
Soil Piles EF = 0.38 lbs/day/acres graded

Graded Surface EF = 26.4 lbs/day/acre (recommended in CEQA Manual, p. A9-93).

Calculation of Annual PM_{10} Emissions

Source	Emission Factor	Graded Acres/yr	Exposed days/yr	Emissions lbs/yr	Emissions tons/yr
Bulldozing	1.90 lbs/acre	2.16	NA	4	0.002
Grading	0.80 lbs/acre	2.16	NA	2	0.001
Vehicle Traffic	15.00 lbs/acre	2.16	NA	32	0.016
Erosion of Soil Piles	0.38 lbs/acre/day	2.16	90	74	0.037
Erosion of Graded Surface	26.40 lbs/acre/day	2.16	90	5,138	2.569
TOTAL				5,250	2.63

Soil Disturbance EF: 17.70 lbs/acre
Wind Erosion EF: 26.78 lbs/acre/day

Back calculate to get EF: 2,010.08 lbs/acre/grading day

Grading Schedule for CY 2009

Estimate of time required to grade a specified area.

Input Parameters
Construction area: 2.16 acres/yr (from "CY2009 Combustion" Worksheet)
Qty Equipment: 3.00 (calculated based on 3 pieces of equipment for every 10 acres)

Assumptions.
Terrain is mostly flat.
An average of 6" soil is excavated from one half of the site and backfilled to the other half of the site; no soil is hauled off-site or borrowed.
200 hp bulldozers are used for site clearing.
300 hp bulldozers are used for stripping, excavation, and backfill.
Vibratory drum rollers are used for compacting.
Stripping, Excavation, Backfill and Compaction require an average of two passes each.
Excavation and Backfill are assumed to involve only half of the site.

Calculation of days required for one piece of equipment to grade the specified area.

Reference: Means Heavy Construction Cost Data, 19th Ed., R. S. Means, 2005.

Means Line No.	Operation	Description	Output	Units	Acres per equip-day)	equip-days per acre	Acres/yr (project-specific)	Equip-days per year
2230 200 0550	Site Clearing	Dozer & rake, medium brush	8	acre/day	8	0.13	2.16	0.27
2230 500 0300	Stripping	Topsoil & stockpiling, adverse soil	1,650	cu. yd/day	2.05	0.49	2.16	1.06
2315 432 5220	Excavation	Bulk, open site, common earth, 150' haul	800	cu. yd/day	0.99	1.01	1.08	1.09
2315 120 5220	Backfill	Structural, common earth, 150' haul	1,950	cu. yd/day	2.42	0.41	1.08	0.45
2315 310 5020	Compaction	Vibrating roller, 6 " lifts, 3 passes	2,300	cu. yd/day	2.85	0.35	2.16	0.76
TOTAL								3.62

Calculation of days required for the indicated pieces of equipment to grade the designated acreage.

(Equip)(day)/yr: 3.62
Qty Equipment: 3.00
Grading days/yr: 1.21

Puget Sound Intrastate Air Quality Control Region (PSIAQCR)

			Area Source Emissions						Point Source Emissions					
Row #	State	County	CO	NOx	PM10	PM2.5	SO2	VOC	CO	NOx	PM10	PM2.5	SO2	VOC
1	WA	King Co	592,945	68,344	18,316	6,953	5,119	71850	4,161	5538	407	246	1007	2751
2	WA	Kitsap Co	68,882	6,446	5,914	1,813	390	8485	51.4	132	93.5	75.5	79.7	180
3	WA	Pierce Co	198,330	26,781	9,539	3,104	2,157	25267	18,988	2334	983	779	3051	756
4	WA	Snohomish Co	182,504	20415	14,397	4608	1272	23094	496	1012	93.6	88.2	352	1057
Grand Total			1,042,661	121,986	48,166	16,478	8,938	128,696	23,696	9,016	1,577	1,189	4,490	4,744

SOURCE:
http://www.epa.gov/air/data/geosel.html
USEPA - AirData NET Tier Report
*Net Air pollution sources (area and point) in tons per year (2001)
Site visited on 21 June 2007

PSIAQCR : King Co, Kitsap Co, Pierce Co, and Snohomish Co.

Summary	Summarizes total emissions by calendar year.
Combustion	Estimates emissions from non-road equipment exhaust as well as painting.
Fugitive	Estimates fine particulate emissions from earthmoving, vehicle traffic, and windblown dust
Grading	Estimates the number of days of site preparation, to be used for estimating heavy equipment exhaust and earthmoving dust emissions
AQCR Tier Report	Summarizes total emissions for the Puget Sound Intrastate AQCR Tier Reports for 2001, to be used to compare project to regional emissions.

Emissions from Proposed Action

		NO_x (ton)	VOC (ton)	CO (ton)	SO_2 (ton)	PM_{10} (ton)
CY2014	Construction Combustion	2.544	0.436	3.707	0.051	0.071
	Construction Fugitive Dust	0.000	0.000	0.000	0.000	7.120
	TOTAL CY2014	2.544	0.436	3.707	0.051	7.192

Since future year budgets were not readily available, actual 2001 air emissions inventories for the counties were used as an approximation of the regional inventory. Because the Proposed Action is several orders of magnitude below significance, the conclusion would be the same, regardless of whether future year budget data set were used.

Puget Sound Intrastate AQCR

	Point and Area Sources Combined				
Year	NO_x (tpy)	VOC (tpy)	CO (tpy)	SO_2 (tpy)	PM_{10} (tpy)
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Source: USEPA-AirData NET Tier Report (http://www.epa.gov/air/data/geosel.html). Site visited on 21 June 2007.

Determination Significance (Significance Threshold = 10%)

	Point and Area Sources Combined				
	NO_x (tpy)	VOC (tpy)	CO (tpy)	SO_2 (tpy)	PM_{10} (tpy)
Minimum - 2001	131,002	133,440	1,066,357	13,428	49,743
CY2014 Emissions	2.544	0.436	3.707	0.051	7.192
Proposed Action %	**0.0019%**	**0.0003%**	**0.0003%**	**0.0004%**	**0.0145%**

Combustion Emissions for CY 2014

Combustion Emissions of VOC, NO_x, SO_2, CO and PM_{10} Due to Construction

Includes:

100% of Demolish Existing Base Engineering Facilities (Buildings 529, 533, 535, 536, 537, 538, 540, 541, 561, 562, 563, and 24011)	255,500	ft²	5.87	acres

Total Building Construction Area:	0	ft²	(None)
Total Demolished Area:	255,500	ft²	
Total Paved Area:	0	ft²	(None)
Total Disturbed Area:	255,500	ft²	
Construction Duration:	1.0	year(s)	
Annual Construction Activity:	230	days/yr	

Emission Factors Used for Construction Equipment

Reference: Guide to Air Quality Assessment, SMAQMD, 2004

Emission factors are taken from Table 3-2. Assumptions regarding the type and number of equipment are from Table 3-1 unless otherwise noted.

Grading

Equipment	No. Reqd.[a] per 10 acres	NO_x (lb/day)	VOC[b] (lb/day)	CO (lb/day)	SO_2[c]	PM_{10} (lb/day)
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Equipment	No. Reqd.[a] per 10 acres	NO_x (lb/day)	VOC[b] (lb/day)	CO (lb/day)	SO_2[c]	PM_{10} (lb/day)
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Roller	1	5.01	0.86	7.34	0.10	0.14
Total per 10 acres of activity	2	12.94	2.23	18.96	0.26	0.36

Demolition

Equipment	No. Reqd.[a] per 10 acres	NO_x (lb/day)	VOC[b] (lb/day)	CO (lb/day)	SO_2[c]	PM_{10} (lb/day)
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Building Construction

Equipment[d]	No. Reqd.[a] per 10 acres	NO_x (lb/day)	VOC[b] (lb/day)	CO (lb/day)	SO_2[c]	PM_{10} (lb/day)
Stationary						
Generator Set	1	11.83	1.47	10.09	0.24	0.47
Industrial Saw	1	17.02	2.12	14.52	0.34	0.68
Welder	1	4.48	0.56	3.83	0.09	0.18
Mobile (non-road)						
Truck	1	20.89	3.60	30.62	0.84	0.58
Forklift	1	4.57	0.79	6.70	0.18	0.13
Crane	1	8.37	1.44	12.27	0.33	0.23
Total per 10 acres of activity	6	67.16	9.98	78.03	2.02	2.27

Note: Footnotes for tables are on following page

Architectural Coatings

Equipment	No. Reqd.[a] per 10 acres	NO_x (lb/day)	VOC[b] (lb/day)	CO (lb/day)	SO_2[c]	PM_{10} (lb/day)
Air Compressor	1	6.83	0.85	5.82	0.14	0.27
Total per 10 acres of activity	1	6.83	0.85	5.82	0.14	0.27

a) The SMAQMD 2004 guidance suggests a default equipment fleet for each activitiy, assuming 10 acres of that activity, (e.g., 10 acres of grading, 10 acres of paving, etc.). The default equipment fleet is increased for each 10 acre increment in the size of the construction project. That is, a 26 acre project would round to 30 acres and the fleet size would be three times the default fleet for a 10 acre project.

b) The SMAQMD 2004 reference lists emission factors for reactive organic gas (ROG). For the purposes of this worksheet ROG = VOC.

c) The SMAQMD 2004 reference does not provide SO_2 emission factors. For this worksheet, SO_2 emissions have been estimated based on approximate fuel use rate for diesel equipment and the assumption of 500 ppm sulfur diesel fuel. For the average of the equipment fleet, the resulting SO_2 factor was found to be approximately 0.04 times the NOx emission factor for the mobile equipment (based upon 2002 USAF IERA "Air Emissions Inventory Guidance") and 0.02 times the NOx emission factor for all other equipment (based on AP-42, Table 3.4-1)

d) Typical equipment fleet for building construction was not itemized in SMAQMD 2004 guidance. The equipment list above was assumed based on SMAQMD 1994 guidance.

PROJECT-SPECIFIC EMISSION FACTOR SUMMARY

Source	Equipment Multiplier*	SMAQMD Emission Factors (lb/day)				
		NO_x	VOC	CO	SO_2**	PM_{10}
Grading Equipment	1	35.492	5.291	41.463	0.710	1.191
Paving Equipment	1	0.000	0.000	0.000	0.000	0.000
Demolition Equipment	1	16.863	2.903	24.717	0.337	0.469
Building Construction	1	0.000	0.000	0.000	0.000	0.000
Air Compressor for Architectural Coating	1	0.000	0.000	0.000	0.000	0.000
Architectural Coating**			0.000			

*The equipment multiplier is an integer that represents units of 10 acres for purposes of estimating the number of equipment required for the project

**Emission factor is from the evaporation of solvents during painting, per "Air Quality Thresholds of Significance", SMAQMD, 1994

Example: SMAQMD Emission Factor for Grading Equipment NOx = (Total Grading NOx per 10 ac*((total disturbed area/43560)/10))*(Equipment Multiplier)

Summary of Input Parameters

	Total Area (ft^2)	Total Area (acres)	Total Days	
Grading:	255,500	5.87	4	(from "CY2014 Grading" worksheet)
Paving:	0	0.00	0	
Demolition:	255,500	5.87	293	
Building Construction:	0	0.00	0	
Architectural Coating	0	0.00	0	(per SMAQMD "Air Quality of Thresholds of Significance", 1994)

NOTE: The 'Total Days' estimate for paving is calculated by dividing the total number of acres by 0.21 acres/day, which is a factor derived from the 2005 MEANS Heavy Construction Cost Data, 19th Edition, for 'Asphaltic Concrete Pavement, Lots and Driveways - 6" stone base', which provides an estimate of square feet paved per day. There is also an estimate for 'Plain Cement Concrete Pavement', however the estimate for asphalt is used because it is more conservative. The 'Total 'Days' estimate for demolition is calculated by dividing the total number of acres by 0.02 acres/day, which is a factor also derived from the 2005 MEANS reference. This is calculated by averaging the demolition estimates from 'Building Demolition - Small Buildings, Concrete', assuming a height of 30 feet for a two-story building; from 'Building Footings and Foundations Demolition - 6" Thick, Plain Concrete'; and from 'Demolish, Remove Pavement and Curb - Concrete to 6" thick, rod reinforced'. Paving is double-weighted since projects typically involve more paving demolition. The 'Total Days' estimate for building construction is assumed to be 230 days, unless project-specific data is known.

Total Project Emissions by Activity (lbs)

	NO_x	VOC	CO	SO_2	PM_{10}
Grading Equipment	141.97	21.16	165.85	2.84	4.76
Paving	-	-	-	-	-
Demolition	4,945.54	851.49	7,248.87	98.91	137.62
Building Construction	-	-	-	-	-
Architectural Coatings	-	-	-	-	-
Total Emissions (lbs):	**5,087.51**	**872.66**	**7,414.73**	**101.75**	**142.38**

Results: Total Project Annual Emission Rates

	NO_x	VOC	CO	SO_2	PM_{10}
Total Project Emissions (lbs)	5,087.51	872.66	7,414.73	101.75	142.38
Total Project Emissions (tons)	2.5438	0.4363	3.7074	0.0509	0.0712

Fugitive Dust Emissions for CY 2014

Calculation of PM_{10} Emissions Due to Site Preparation (Uncontrolled).

User Input Parameters / Assumptions

Acres graded per year:	5.87	acres/yr	(From "CY2014 Combustion" worksheet)
Grading days/yr:	3.28	days/yr	(From "CY2014 Grading worksheet)
Exposed days/yr:	90	assumed days/yr graded area is exposed	
Grading Hours/day:	8	hr/day	
Soil piles area fraction:	0.10	(assumed fraction of site area covered by soil piles)	
Soil percent silt, s:	8.5	%	(mean silt content; expected range: 0.56 to 23, AP-42 Table 13.2.2-1)
Soil percent moisture, M:	15	%	(http://www.cpc.noaa.gov/products/soilmst/w.shtml)
Annual rainfall days, p:	180	days/yr rainfall exceeds 0.01 inch/day (AP-42 Fig 13.2.2-1)	
Wind speed > 12 mph %, I:	15	%	Ave. of wind speed at Olympia, WA (ftp://ftp.wcc.nrcs.usda.gov/downloads/climate/windrose/washington/olympia)
Fraction of TSP, J:	0.5	per California Environmental Quality Act (CEQA) Air Quality Handbook, SCAQMD, 1993, p. A9-99	
Mean vehicle speed, S:	5	mi/hr	(On-site)
Dozer path width:	8	ft	
Qty construction vehicles:	3.00	vehicles	(From "CY2014 Grading worksheet)
On-site VMT/vehicle/day:	5	mi/veh/day	(Excluding bulldozer VMT during grading)
PM_{10} Adjustment Factor k	1.5	lb/VMT	(AP-42 Table 13.2.2-2 12/03 for PM_{10} for unpaved roads)
PM_{10} Adjustment Factor a	0.9	(dimensionless)	(AP-42 Table 13.2.2-2 12/03 for PM_{10} for unpaved roads)
PM_{10} Adjustment Factor b	0.45	(dimensionless)	(AP-42 Table 13.2.2-2 12/03 for PM_{10} for unpaved roads)
Mean Vehicle Weight W	40	tons	assumed for aggregate trucks

TSP - Total Suspended Particulate
VMT - Vehicle Miles Traveled

Emissions Due to Soil Disturbance Activities

Operation Parameters (Calculated from User Inputs)

Grading duration per acre	4.5	hr/acre	
Bulldozer mileage per acre	1	VMT/acre	(Miles traveled by bulldozer during grading)
Construction VMT per day	15	VMT/day	
Construction VMT per acre	8.4	VMT/acre	(Travel on unpaved surfaces within site)

Equations Used (Corrected for PM_{10})

Operation	Empirical Equation	Units	AP-42 Section (5th Edition)
Bulldozing	$0.75(s^{1.5})/(M^{1.4})$	lbs/hr	Table 11.9-1, Overburden
Grading	$(0.60)(0.051)s^{2.0}$	lbs/VMT	Table 11.9-1,
Vehicle Traffic (unpaved roads)	$[(k(s/12)^{a} (W/3)^{b})]\ [(365-P)/365]$	lbs/VMT	Section 13.2.2

Source: Compilation of Air Pollutant Emission Factors, Vol. I, USEPA AP-42, Section 11.9 dated 10/98 and Section 13.2 dated 12/03

Calculation of PM_{10} Emission Factors for Each Operation

Operation	Emission Factor (mass/ unit)	Operation Parameter	Emission Factor (lbs/ acre)
Bulldozing	0.42 lbs/hr	4.5 hr/acre	1.90 lbs/acre
Grading	0.77 lbs/VMT	1 VMT/acre	0.80 lbs/acre
Vehicle Traffic (unpaved roads)	1.79 lbs/VMT	8.4 VMT/acre	15.00 lbs/acre

Emissions Due to Wind Erosion of Soil Piles and Exposed Graded Surface

Reference: California Environmental Quality Act (CEQA) Air Quality Handbook, SCAQMD, 1993.

Soil Piles EF = 1.7(s/1.5)[(365 - p)/235](I/15)(J) = (s)(365 - p)(I)(J)/(3110.2941), p. A9-99.

Soil Piles EF = 3.8 lbs/day/acre covered by soil piles

Consider soil piles area fraction so that EF applies to graded area

Soil piles area fraction: 0.10 (Fraction of site area covered by soil piles)
Soil Piles EF = 0.38 lbs/day/acres graded

Graded Surface EF = 26.4 lbs/day/acre (recommended in CEQA Manual, p. A9-93).

Calculation of Annual PM_{10} Emissions

Source	Emission Factor	Graded Acres/yr	Exposed days/yr	Emissions lbs/yr	Emissions tons/yr
Bulldozing	1.90 lbs/acre	5.87	NA	11	0.006
Grading	0.80 lbs/acre	5.87	NA	5	0.002
Vehicle Traffic	15.00 lbs/acre	5.87	NA	88	0.044
Erosion of Soil Piles	0.38 lbs/acre/day	5.87	90	201	0.100
Erosion of Graded Surface	26.40 lbs/acre/day	5.87	90	13,936	6.968
TOTAL				14,241	7.12

Soil Disturbance EF: 17.70 lbs/acre
Wind Erosion EF: 26.78 lbs/acre/day

Back calculate to get EF: 741.10 lbs/acre/grading day

Grading Schedule for CY 2014

Estimate of time required to grade a specified area.

Input Parameters
Construction area: 5.87 acres/yr (from "CY2014 Combustion" Worksheet)
Qty Equipment: 3.00 (calculated based on 3 pieces of equipment for every 10 acres)

Assumptions.
Terrain is mostly flat.
An average of 6" soil is excavated from one half of the site and backfilled to the other half of the site; no soil is hauled off-site or borrowed.
200 hp bulldozers are used for site clearing.
300 hp bulldozers are used for stripping, excavation, and backfill.
Vibratory drum rollers are used for compacting.
Stripping, Excavation, Backfill and Compaction require an average of two passes each.
Excavation and Backfill are assumed to involve only half of the site.

Calculation of days required for one piece of equipment to grade the specified area.

Reference: Means Heavy Construction Cost Data, 19th Ed., R. S. Means, 2005.

Means Line No.	Operation	Description	Output	Units	Acres per equip-day)	equip-days per acre	Acres/yr (project-specific)	Equip-days per year
2230 200 0550	Site Clearing	Dozer & rake, medium brush	8	acre/day	8	0.13	5.87	0.73
2230 500 0300	Stripping	Topsoil & stockpiling, adverse soil	1,650	cu. yd/day	2.05	0.49	5.87	2.87
2315 432 5220	Excavation	Bulk, open site, common earth, 150' haul	800	cu. yd/day	0.99	1.01	2.93	2.96
2315 120 5220	Backfill	Structural, common earth, 150' haul	1,950	cu. yd/day	2.42	0.41	2.93	1.21
2315 310 5020	Compaction	Vibrating roller, 6 " lifts, 3 passes	2,300	cu. yd/day	2.85	0.35	5.87	2.06
TOTAL								9.83

Calculation of days required for the indicated pieces of equipment to grade the designated acreage.

(Equip)(day)/yr: 9.83
Qty Equipment: 3.00
Grading days/yr: 3.28

Puget Sound Intrastate Air Quality Control Region (PSIAQCR)

			Area Source Emissions						Point Source Emissions					
Row #	State	County	CO	NOx	PM10	PM2.5	SO2	VOC	CO	NOx	PM10	PM2.5	SO2	VOC
1	WA	King Co	592,945	68,344	18,316	6,953	5,119	71850	4,161	5538	407	246	1007	2751
2	WA	Kitsap Co	68,882	6,446	5,914	1,813	390	8485	51.4	132	93.5	75.5	79.7	180
3	WA	Pierce Co	198,330	26,781	9,539	3,104	2,157	25267	18,988	2334	983	779	3051	756
4	WA	Snohomish Co	182,504	20415	14,397	4608	1272	23094	496	1012	93.6	88.2	352	1057
Grand Total			1,042,661	121,986	48,166	16,478	8,938	128,696	23,696	9,016	1,577	1,189	4,490	4,744

SOURCE:
http://www.epa.gov/air/data/geosel.html
USEPA - AirData NET Tier Report
*Net Air pollution sources (area and point) in tons per year (2001)
Site visited on 21 June 2007

PSIAQCR : King Co, Kitsap Co, Pierce Co, and Snohomish Co.

Summary	Summarizes total emissions by calendar year.
Combustion	Estimates emissions from non-road equipment exhaust as well as painting.
Fugitive	Estimates fine particulate emissions from earthmoving, vehicle traffic, and windblown dust
Grading	Estimates the number of days of site preparation, to be used for estimating heavy equipment exhaust and earthmoving dust emissions
AQCR Tier Report	Summarizes total emissions for the Puget Sound Intrastate AQCR Tier Reports for 2001, to be used to compare project to regional emissions.

Emissions from Proposed Action

		NO_x (ton)	VOC (ton)	CO (ton)	SO_2 (ton)	PM_{10} (ton)
CY2009	Construction Combustion	21.768	3.442	27.945	0.435	0.682
	Construction Fugitive Dust	0.000	0.000	0.000	0.000	63.514
	TOTAL CY2009	21.768	3.442	27.945	0.435	64.196

Since future year budgets were not readily available, actual 2001 air emissions inventories for the counties were used as an approximation of the regional inventory. Because the Proposed Action is several orders of magnitude below significance, the conclusion would be the same, regardless of whether future year budget data set were used.

Puget Sound Intrastate AQCR

	Point and Area Sources Combined				
Year	NO_x (tpy)	VOC (tpy)	CO (tpy)	SO_2 (tpy)	PM_{10} (tpy)
2001	131,002	133,440	1,066,357	13,428	49,743

Source: USEPA-AirData NET Tier Report (http://www.epa.gov/air/data/geosel.html). Site visited on 21 June 2007.

Determination Significance (Significance Threshold = 10%)

	Point and Area Sources Combined				
	NO_x (tpy)	VOC (tpy)	CO (tpy)	SO_2 (tpy)	PM_{10} (tpy)
Minimum - 2001	131,002	133,440	1,066,357	13,428	49,743
CY2009 Emissions	21.768	3.442	27.945	0.435	64.196
Proposed Action %	**0.0166%**	**0.0026%**	**0.0026%**	**0.0032%**	**0.1291%**

Combustion Emissions for CY 2009

Combustion Emissions of VOC, NO_x, SO_2, CO and PM_{10} Due to Construction

Includes:

100% of Repair Portions of Taxiway C	2,280,000	ft²	52.34	acres

Total Building Construction Area:	0	ft²	(None)
Total Demolished Area:	0	ft²	
Total Paved Area:	2,280,000	ft²	(None)
Total Disturbed Area:	2,280,000	ft²	
Construction Duration:	1.0	year(s)	
Annual Construction Activity:	230	days/yr	

Emission Factors Used for Construction Equipment

Reference: Guide to Air Quality Assessment, SMAQMD, 2004

Emission factors are taken from Table 3-2. Assumptions regarding the type and number of equipment are from Table 3-1 unless otherwise noted.

Grading

Equipment	No. Reqd.[a] per 10 acres	NO_x (lb/day)	VOC[b] (lb/day)	CO (lb/day)	SO_2[c]	PM_{10} (lb/day)
Bulldozer	1	29.40	3.66	25.09	0.59	1.17
Motor Grader	1	10.22	1.76	14.98	0.20	0.28
Water Truck	1	20.89	3.60	30.62	0.42	0.58
Total per 10 acres of activity	3	60.51	9.02	70.69	1.21	2.03

Paving

Equipment	No. Reqd.[a] per 10 acres	NO_x (lb/day)	VOC[b] (lb/day)	CO (lb/day)	SO_2[c]	PM_{10} (lb/day)
Paver	1	7.93	1.37	11.62	0.16	0.22
Roller	1	5.01	0.86	7.34	0.10	0.14
Total per 10 acres of activity	2	12.94	2.23	18.96	0.26	0.36

Demolition

Equipment	No. Reqd.[a] per 10 acres	NO_x (lb/day)	VOC[b] (lb/day)	CO (lb/day)	SO_2[c]	PM_{10} (lb/day)
Loader	1	7.86	1.35	11.52	0.16	0.22
Haul Truck	1	20.89	3.60	30.62	0.42	0.58
Total per 10 acres of activity	2	28.75	4.95	42.14	0.58	0.80

Building Construction

Equipment[d]	No. Reqd.[a] per 10 acres	NO_x (lb/day)	VOC[b] (lb/day)	CO (lb/day)	SO_2[c]	PM_{10} (lb/day)
Stationary						
Generator Set	1	11.83	1.47	10.09	0.24	0.47
Industrial Saw	1	17.02	2.12	14.52	0.34	0.68
Welder	1	4.48	0.56	3.83	0.09	0.18
Mobile (non-road)						
Truck	1	20.89	3.60	30.62	0.84	0.58
Forklift	1	4.57	0.79	6.70	0.18	0.13
Crane	1	8.37	1.44	12.27	0.33	0.23
Total per 10 acres of activity	6	67.16	9.98	78.03	2.02	2.27

Note: Footnotes for tables are on following page

Architectural Coatings

Equipment	No. Reqd.[a] per 10 acres	NO_x (lb/day)	VOC[b] (lb/day)	CO (lb/day)	SO_2[c]	PM_{10} (lb/day)
Air Compressor	1	6.83	0.85	5.82	0.14	0.27
Total per 10 acres of activity	1	6.83	0.85	5.82	0.14	0.27

a) The SMAQMD 2004 guidance suggests a default equipment fleet for each activitiy, assuming 10 acres of that activity, (e.g., 10 acres of grading, 10 acres of paving, etc.). The default equipment fleet is increased for each 10 acre increment in the size of the construction project. That is, a 26 acre project would round to 30 acres and the fleet size would be three times the default fleet for a 10 acre project.

b) The SMAQMD 2004 reference lists emission factors for reactive organic gas (ROG). For the purposes of this worksheet ROG = VOC.

c) The SMAQMD 2004 reference does not provide SO_2 emission factors. For this worksheet, SO_2 emissions have been estimated based on approximate fuel use rate for diesel equipment and the assumption of 500 ppm sulfur diesel fuel. For the average of the equipment fleet, the resulting SO_2 factor was found to be approximately 0.04 times the NOx emission factor for the mobile equipment (based upon 2002 USAF IERA "Air Emissions Inventory Guidance") and 0.02 times the NOx emission factor for all other equipment (based on AP-42, Table 3.4-1)

d) Typical equipment fleet for building construction was not itemized in SMAQMD 2004 guidance. The equipment list above was assumed based on SMAQMD 1994 guidance.

PROJECT-SPECIFIC EMISSION FACTOR SUMMARY

Source	Equipment Multiplier*	SMAQMD Emission Factors (lb/day)				
		NO_x	VOC	CO	SO_2**	PM_{10}
Grading Equipment	6	1900.314	283.273	2220.017	38.006	63.752
Paving Equipment	6	406.380	70.033	595.438	8.128	11.306
Demolition Equipment	1	0.000	0.000	0.000	0.000	0.000
Building Construction	1	0.000	0.000	0.000	0.000	0.000
Air Compressor for Architectural Coating	1	0.000	0.000	0.000	0.000	0.000
Architectural Coating**			0.000			

*The equipment multiplier is an integer that represents units of 10 acres for purposes of estimating the number of equipment required for the project

**Emission factor is from the evaporation of solvents during painting, per "Air Quality Thresholds of Significance", SMAQMD, 1994

Example: SMAQMD Emission Factor for Grading Equipment NOx = (Total Grading NOx per 10 ac*((total disturbed area/43560)/10))*(Equipment Multiplier)

Summary of Input Parameters

	Total Area (ft^2)	Total Area (acres)	Total Days	
Grading:	2,280,000	52.34	14	(from "CY2009 Grading" worksheet)
Paving:	2,280,000	52.34	42	
Demolition:	0	0.00	0	
Building Construction:	0	0.00	0	
Architectural Coating	0	0.00	0	(per SMAQMD "Air Quality of Thresholds of Significance", 1994)

NOTE: The 'Total Days' estimate for paving is calculated by dividing the total number of acres by 0.21 acres/day, which is a factor derived from the 2005 MEANS Heavy Construction Cost Data, 19th Edition, for 'Asphaltic Concrete Pavement, Lots and Driveways - 6" stone base', which provides an estimate of square feet paved per day. There is also an estimate for 'Plain Cement Concrete Pavement', however the estimate for asphalt is used because it is more conservative. The 'Total 'Days' estimate for demolition is calculated by dividing the total number of acres by 0.02 acres/day, which is a factor also derived from the 2005 MEANS reference. This is calculated by averaging the demolition estimates from 'Building Demolition - Small Buildings, Concrete', assuming a height of 30 feet for a two-story building; from 'Building Footings and Foundations Demolition - 6" Thick, Plain Concrete'; and from 'Demolish, Remove Pavement and Curb - Concrete to 6" thick, rod reinforced'. Paving is double-weighted since projects typically involve more paving demolition. The 'Total Days' estimate for building construction is assumed to be 230 days, unless project-specific data is known.

Total Project Emissions by Activity (lbs)

	NO_x	VOC	CO	SO_2	PM_{10}
Grading Equipment	26,604.40	3,965.82	31,080.23	532.09	892.53
Paving	16,932.51	2,918.04	24,809.92	338.65	471.07
Demolition	-	-	-	-	-
Building Construction	-	-	-	-	-
Architectural Coatings	-	-	-	-	-
Total Emissions (lbs):	**43,536.90**	**6,883.86**	**55,890.15**	**870.74**	**1,363.60**

Results: Total Project Annual Emission Rates

	NO_x	VOC	CO	SO_2	PM_{10}
Total Project Emissions (lbs)	43,536.90	6,883.86	55,890.15	870.74	1,363.60
Total Project Emissions (tons)	21.7685	3.4419	27.9451	0.4354	0.6818

Fugitive Dust Emissions for CY 2009

Calculation of PM_{10} Emissions Due to Site Preparation (Uncontrolled).

User Input Parameters / Assumptions

Acres graded per year:	52.34	acres/yr	(From "CY2009 Combustion" worksheet)
Grading days/yr:	13.96	days/yr	(From "CY2009 Grading worksheet)
Exposed days/yr:	90	assumed days/yr graded area is exposed	
Grading Hours/day:	8	hr/day	
Soil piles area fraction:	0.10	(assumed fraction of site area covered by soil piles)	
Soil percent silt, s:	8.5	%	(mean silt content; expected range: 0.56 to 23, AP-42 Table 13.2.2-1)
Soil percent moisture, M:	15	%	(http://www.cpc.noaa.gov/products/soilmst/w.shtml)
Annual rainfall days, p:	180	days/yr rainfall exceeds 0.01 inch/day (AP-42 Fig 13.2.2-1)	
Wind speed > 12 mph %, I:	15	%	Ave. of wind speed at Olympia, WA (ftp://ftp.wcc.nrcs.usda.gov/downloads/climate/windrose/washington/olympia)
Fraction of TSP, J:	0.5	per California Environmental Quality Act (CEQA) Air Quality Handbook, SCAQMD, 1993, p. A9-99	
Mean vehicle speed, S:	5	mi/hr	(On-site)
Dozer path width:	8	ft	
Qty construction vehicles:	6.28	vehicles	(From "CY2009 Grading worksheet)
On-site VMT/vehicle/day:	5	mi/veh/day	(Excluding bulldozer VMT during grading)
PM_{10} Adjustment Factor k	1.5	lb/VMT	(AP-42 Table 13.2.2-2 12/03 for PM_{10} for unpaved roads)
PM_{10} Adjustment Factor a	0.9	(dimensionless)	(AP-42 Table 13.2.2-2 12/03 for PM_{10} for unpaved roads)
PM_{10} Adjustment Factor b	0.45	(dimensionless)	(AP-42 Table 13.2.2-2 12/03 for PM_{10} for unpaved roads)
Mean Vehicle Weight W	40	tons	assumed for aggregate trucks

TSP - Total Suspended Particulate
VMT - Vehicle Miles Traveled

Emissions Due to Soil Disturbance Activities

Operation Parameters (Calculated from User Inputs)

Grading duration per acre	2.1	hr/acre	
Bulldozer mileage per acre	1	VMT/acre	(Miles traveled by bulldozer during grading)
Construction VMT per day	31	VMT/day	
Construction VMT per acre	8.4	VMT/acre	(Travel on unpaved surfaces within site)

Equations Used (Corrected for PM_{10})

Operation	Empirical Equation	Units	AP-42 Section (5th Edition)
Bulldozing	$0.75(s^{1.5})/(M^{1.4})$	lbs/hr	Table 11.9-1, Overburden
Grading	$(0.60)(0.051)s^{2.0}$	lbs/VMT	Table 11.9-1,
Vehicle Traffic (unpaved roads)	$[(k(s/12)^{a} (W/3)^{b})]\ [(365-P)/365]$	lbs/VMT	Section 13.2.2

Source: Compilation of Air Pollutant Emission Factors, Vol. I, USEPA AP-42, Section 11.9 dated 10/98 and Section 13.2 dated 12/03

Calculation of PM_{10} Emission Factors for Each Operation

Operation	Emission Factor (mass/ unit)	Operation Parameter	Emission Factor (lbs/ acre)
Bulldozing	0.42 lbs/hr	2.1 hr/acre	0.90 lbs/acre
Grading	0.77 lbs/VMT	1 VMT/acre	0.80 lbs/acre
Vehicle Traffic (unpaved roads)	1.79 lbs/VMT	8.4 VMT/acre	15.00 lbs/acre

Emissions Due to Wind Erosion of Soil Piles and Exposed Graded Surface

Reference: California Environmental Quality Act (CEQA) Air Quality Handbook, SCAQMD, 1993.

Soil Piles EF = 1.7(s/1.5)[(365 - p)/235](I/15)(J) = (s)(365 - p)(I)(J)/(3110.2941), p. A9-99.

Soil Piles EF = 3.8 lbs/day/acre covered by soil piles

Consider soil piles area fraction so that EF applies to graded area

Soil piles area fraction: 0.10 (Fraction of site area covered by soil piles)
Soil Piles EF = 0.38 lbs/day/acres graded

Graded Surface EF = 26.4 lbs/day/acre (recommended in CEQA Manual, p. A9-93).

Calculation of Annual PM_{10} Emissions

Source	Emission	Factor	Graded Acres/yr	Exposed days/yr	Emissions lbs/yr	Emissions tons/yr
Bulldozing	0.90	lbs/acre	52.34	NA	47	0.024
Grading	0.80	lbs/acre	52.34	NA	42	0.021
Vehicle Traffic	15.00	lbs/acre	52.34	NA	785	0.393
Erosion of Soil Piles	0.38	lbs/acre/day	52.34	90	1,790	0.895
Erosion of Graded Surface	26.40	lbs/acre/day	52.34	90	124,364	62.182
TOTAL					127,028	63.51

Soil Disturbance EF: 16.70 lbs/acre
Wind Erosion EF: 26.78 lbs/acre/day

Back calculate to get EF: 173.80 lbs/acre/grading day

Grading Schedule for CY 2009

Estimate of time required to grade a specified area.

Input Parameters
Construction area: 52.34 acres/yr (from "CY2009 Combustion" Worksheet)
Qty Equipment: 6.28 (calculated based on 3 pieces of equipment for every 10 acres)

Assumptions.
Terrain is mostly flat.
An average of 6" soil is excavated from one half of the site and backfilled to the other half of the site; no soil is hauled off-site or borrowed.
200 hp bulldozers are used for site clearing.
300 hp bulldozers are used for stripping, excavation, and backfill.
Vibratory drum rollers are used for compacting.
Stripping, Excavation, Backfill and Compaction require an average of two passes each.
Excavation and Backfill are assumed to involve only half of the site.

Calculation of days required for one piece of equipment to grade the specified area.

Reference: Means Heavy Construction Cost Data, 19th Ed., R. S. Means, 2005.

Means Line No.	Operation	Description	Output	Units	Acres per equip-day)	equip-days per acre	Acres/yr (project-specific)	Equip-days per year
2230 200 0550	Site Clearing	Dozer & rake, medium brush	8	acre/day	8	0.13	52.34	6.54
2230 500 0300	Stripping	Topsoil & stockpiling, adverse soil	1,650	cu. yd/day	2.05	0.49	52.34	25.59
2315 432 5220	Excavation	Bulk, open site, common earth, 150' haul	800	cu. yd/day	0.99	1.01	26.17	26.39
2315 120 5220	Backfill	Structural, common earth, 150' haul	1,950	cu. yd/day	2.42	0.41	26.17	10.83
2315 310 5020	Compaction	Vibrating roller, 6 " lifts, 3 passes	2,300	cu. yd/day	2.85	0.35	52.34	18.36
TOTAL								87.70

Calculation of days required for the indicated pieces of equipment to grade the designated acreage.

(Equip)(day)/yr: 87.70
Qty Equipment: 6.28
Grading days/yr: 13.96

Puget Sound Intrastate Air Quality Control Region (PSIAQCR)

			Area Source Emissions						Point Source Emissions					
Row #	State	County	CO	NOx	PM10	PM2.5	SO2	VOC	CO	NOx	PM10	PM2.5	SO2	VOC
1	WA	King Co	592,945	68,344	18,316	6,953	5,119	71850	4,161	5538	407	246	1007	2751
2	WA	Kitsap Co	68,882	6,446	5,914	1,813	390	8485	51.4	132	93.5	75.5	79.7	180
3	WA	Pierce Co	198,330	26,781	9,539	3,104	2,157	25267	18,988	2334	983	779	3051	756
4	WA	Snohomish Co	182,504	20415	14,397	4608	1272	23094	496	1012	93.6	88.2	352	1057
Grand Total			1,042,661	121,986	48,166	16,478	8,938	128,696	23,696	9,016	1,577	1,189	4,490	4,744

SOURCE:
http://www.epa.gov/air/data/geosel.html
USEPA - AirData NET Tier Report
*Net Air pollution sources (area and point) in tons per year (2001)
Site visited on 21 June 2007

PSIAQCR : King Co, Kitsap Co, Pierce Co, and Snohomish Co.

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